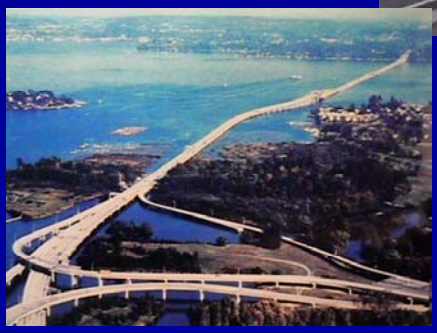
WSDOT MEGA-PROJECTS
COST ESTIMATE VALIDATION PROCESS

SUMMARY INFORMATION



WSDOT - Northwest Washington Division
Urban Corridors Office

SUMMARY INFORMATION PACKAGE
June 2002

This package corresponds to the project information released to the Public, Local Decision Makers and the Press June 3rd, 2002

CEVP PUBLIC RELEASE DOCUMENTS

June 3rd, 2002

Washington State Department of Transportation

EXECUTIVE SUMMARY

PUBLIC RELEASE DOCUMENTS

NEWS ARTICLES

CEVP PROCESS

QUESTIONS & ANSWERS

Executive Summary

INFORMATION REGARDING CEVP AND THE PUBLIC RELEASE PACKAGES

1. EXECUTIVE SUMMARY

The intent of this package is to provide interested parties with an overview of Washington State Department of Transportation's (WSDOT's) Cost Estimate Validation Process (CEVP) and an understanding of the initial CEVP results.

Content of this information package:

1. Executive Summary
2. WSDOT Web text, CEVP description, plus project 1-page summaries (the public release)
3. Examples of news articles in response to WSDOT's release
4. Description of the CEVP workshop and report process with examples
5. Summary Question and Answer list relative to CEVP

What is CEVP?

- CEVP is a tool to estimate project costs by specifically identifying and incorporating uncertainties, risks and opportunities. It reports probable cost as a range, with a specific probability distribution, escalated to year of construction dollars.
- CEVP is a different cost evaluation than a normal estimate; it specifically identifies and includes potential risk and opportunity events in a structured framework.
- CEVP identifies potential problem areas that can be mitigated by management strategies to reduce costs and improve project delivery schedules.
- CEVP includes an examination of each project estimate by a team of top engineers from private firms, public agencies from around the country, risk managers, and WSDOT engineers. This examination involves:
    - Critically reviewing the existing estimate and scope, including removing contingencies and validating unit costs, to determine the "base cost estimate."
    - Identifying and quantifying potential risk and opportunity events that may impact project cost or schedule.
- The risks and opportunities are then modeled, in magnitude and probability, and incorporated in a computer program, which runs many scenarios (using a random "Monte Carlo" technique).
- The output of a model run is a probable range of cost and schedule, which is dependent upon the base costs, as well as the risk and opportunity events, including the probabilities and magnitudes of these events.
- Costs are presented in year of construction dollars, not year of estimate dollars. This is like what parents do when planning for the future. For example, if your daughter will go to college in ten years, and one year of college currently costs $15,000, you would need to plan for about $20,000 per year by the time she gets there.
- CEVP was developed by WSDOT with the aid of specialized consultants from around the country.

Why is WSDOT doing CEVP?

- There is a lack of public trust in cost estimates of large public projects locally, statewide, and nationally.

- WSDOT wants to address the public's concerns by developing better project costs earlier in the process; to answer the question, "Why can't an agency come up with a number the public can believe, and then build the project to that number?"
- To provide realistic cost estimates to the public, with information about how we determined them, so WSDOT can build accountability with the people we serve by delivering projects within these cost estimates.

Additional Benefits of CEVP:

- CEVP results provide a clear way to communicate project expectations to the public, the legislature, and others early on in the life of a project.
- The cost ranges for the CEVP projects provide a tool for the elected officials from King, Snohomish, and Pierce Counties as they develop a ten year finance and expenditure plan to address some of Puget Sound's most significant transportation problems.
- CEVP clearly identifies the risk events that could impact the cost and schedule of the project.
- CEVP leads to a risk management plan to minimize risks and maximize opportunities to reduce cost and schedule.
- CEVP provides additional definition, clarification and understanding of the current project estimate.
- CEVP leads to a better understanding of the probable cost and schedule ranges for projects.
- CEVP leads to a better understanding of the potential risk events.
- CEVP provides information about funding scenarios, alternatives, cashflow and project phasing.

Why did CEVP produce different project costs?

Each project has its own unique conditions that contribute to risk and uncertainty, which can drive costs. Some examples include:

- Year of estimate costs are replaced with costs incurred in the year of expenditure (future, inflated dollars).
- Real estate costs tend to out-pace inflation – this effect is specifically included.
- Seismic risk can be quantified and the uncertainty included.
- Changing state or federal highway standards are modeled and included.

CEVP is still being developed and an initial benchmark calibration process is underway. The CEVP cost ranges are not a warranty for exact final costs, but a more realistic target of what to expect.

Communication

CEVP has already produced dramatic, tangible results for the ten large WSDOT projects listed below, all of which are being considered for funding in the up-coming State and Regional packages except for number 9, Hood Canal Bridge.

1. SR 167, Tacoma to Puyallup New Freeway Construction, Pierce County
2. I-90, Snoqualmie Pass, Kittitas County
3. SR 509, Corridor Completion, South King County
4. I-5, SR 16 HOV Lanes, Pierce County
5. US 395, North Spokane Corridor, Spokane
6. SR 520, Trans-Lake Washington, King County
7. SR 99, Alaskan Way Viaduct and Seawall, Seattle
8. I-405, Corridor Project, King County
9. SR 104, Hood Canal Bridge, Kitsap County
10. I-5, Everett HOV, Everett

The initial CEVP summary results for projects numbered 1-8 were released in briefings to state and county officials, as well as the press, on June 3rd, 2002. Projects 9 and 10 were completed after the June 3rd press release and consequently were not included. The public release information is included in this package and is available on the WSDOT website at http://www.wsdot.wa.gov/projects/cevp/default.htm. Reception was generally very positive and served to focus discussion on the choices to be made. WSDOT has been commended for its efforts to openly communicate with the public about the probable costs of these projects.

CEVP has been well received by political decision-makers, the press, and the public. The Seattle Post-Intelligencer, in a Sunday edition editorial, dated June 9th noted, *"…the Department of Transportation has performed an unprecedented public service with these latest cost estimates. The department offered realistic cost-range estimates. It is a much-needed dose of fiscal reality."* Other papers wrote similar statements. The first National news article on CEVP appeared in Engineering News Record, dated July 1st, 2002, page 15. Other articles are expected to follow.

Current CEVP-related actions:

CEVP, and its shorter version SCoRE, (Scope Cost and Risk Evaluation) are completing the initial phase. The continuing program will be managed by Jennifer Brown within the WSDOT Design Office. The program is currently under development, and may include multiple workshop options, as well as training on topics such as risk based estimating, among others.

For press inquiries please contact Linda Mullen, WSDOT Director of Communications. Linda can be contacted by email at MullenL@WSDOT.WA.GOV or by telephone at 360 705-7075. For other inquiries please contact Jennifer Brown, WSDOT CEVP Manager, via email at Browjen@WSDOT.WA.GOV or by telephone at 360 705-7413.

WSDOT CEVP Initiators:

- Direction: Doug MacDonald, Secretary of Transportation
- Sponsor: David Dye, Urban Corridors Administrator
- Concept(*): John Reilly(**), Michael McBride, David Dye, Cliff Mansfield
- Implementation: Cliff Mansfield
- WSDOT Manager: Jennifer Brown

- Key Consultants:
  - John Reilly, Core Team Advisor, John Reilly Assoc. Int'l
  - Dwight Sangrey & Bill Roberds, Risk and Uncertainty Analysis, Golder Associates
  - Keith Sabol, Cost Validation, Parsons Corporation
  - Art Jones, Base Cost Information, KJM Associates
  - National Constructors Group

(*) The CEVP specific guidelines were developed in January by this group.
(**) International presentations and discussions on this and related topics, 1997-2002.

Public Release Documents

2. WSDOT WEB – CEVP OVERVIEW

The following text is a summary of CEVP that was posted to the Web on June 3rd, 2002. This was concurrent with the release, to State and County officials and the press, of the initial CEVP summary results:

Since February, WSDOT has intensified efforts on cost estimation for the state's largest transportation improvement projects, or "mega projects," included in the Referendum 51 project list. Some of these mega projects could be important parts of the Puget Sound area regional transportation package authorized under legislation passed last March.

This project cost information can be used as officials from King, Snohomish, and Pierce Counties develop 10-year financing and expenditure plans for a program to address some of the Puget Sound region's most significant transportation problems.

WSDOT and state and regional decision makers are aware of public concern and skepticism about the costs of large public projects and how costs just seem to grow and grow. WSDOT wants the public and decision makers to have the best possible information about the likely cost ranges of major transportation projects. The word "range" is important. We cannot wholly predict the future, but we can, with this cost estimating tool, better forecast the range of costs and time a project will require. And then we can more realistically plan for the best – and also the worst – possibilities.

WSDOT has developed the Cost Estimate Validation Process (CEVP) based on the latest cost estimating experience around the country and elsewhere in the world.

CEVP is an intense workshop process, somewhat resembling value engineering. Each project is examined by a team of top engineers from private firms, public agencies from around the country, risk managers, and WSDOT engineers. Many of the participants have had extensive first-hand experience in large project programming and delivery.

What A CEVP Summary Shows

- Project description and benefits.
- Schedule assumptions to adjust estimates to "mid-point of construction" dates for inflation.
- Project cost probability ranges at current state of design.
- Major risk factors and unknowns to which cost estimates are subject.

Summaries have been provided for "full project implementation" and also for scenarios where parts of projects could be undertaken within an overall regional plan. These scenarios have been selected from many possibilities that decision makers could choose.

CEVP provide backup detail for the conclusions stated in the summaries.

CEVP recognizes that every project cost estimate will be a mix of the very likely, the probable, and the maybe. Meeting the estimate of the number of yards and the cost of concrete to be poured for a roadway is pretty likely. It's probable that if the project is built five years from now, inflation will add 20-25% to "today's" project costs – but it would be a different ball game, and probably 15% higher cost, three years after that. And a big maybe – looking into the crystal ball – is whether contaminated soil would be encountered during construction requiring expensive cleanup costs.

The CEVP workshop uses systematic project review and risk assessment methods, including statistics and probability theory, to evaluate the quality of the information at hand and to identify and describe cost and schedule risks. Importantly, the process examines, from the very beginning, how risks can be lowered and cost vulnerabilities managed or reduced. In other words, a dividend of CEVP is to promote the activities that will improve end-of-project cost and schedule results.

CEVP will help communicate to the public the risks identified and their potential cost impacts – so that the public can understand the limits and assumptions of an estimate and better understand what people will actually see as the project proceeds.

CEVP will serve to improve the cooperative effort on a regional proposal and lead to reasonable expectations about what can be delivered from new taxes. It will also improve accountability for the public agencies delivering the projects.

The CEVP Summaries:

CEVP summaries for each mega-project are attached with options for potential project phasing and staging. Each project's CEVP summary reflects the unique features of a separate project. But all of the summaries share the following points:

- Project cost estimates are stated in dollar ranges, not as singes numbers. This reflects the limits of estimating precision at the planning stage when crucial decisions are yet to be made and the specific risks cannot be exactly determined.
- Risk considerations specific to each project are identified and described so that specific risk issues can be foreseen, discussed, and evaluated by the public as the project moves forward.
- Likelihood of project construction schedules have been taken into account and schedule-based adjustments made to the estimates to reflect the smaller purchasing power of dollars to be spent on construction several years in the future.

CEVP is still being developed. The CEVP summaries are not a warranty that the estimates are perfect, for it is true that you only know the final cost of a project when the project is finally completed. CEVP cannot change the fact that it is very early in the project development process for many of these major projects. There are still many unknowns. But risk areas that could drive up project costs can be communicated fairly to the public. In addition, the early identification of a risk area creates management opportunities to minimize the potential of project costs associated with some of those risk areas.

SR 99 Alaskan Way Viaduct and Seawall Replacement

Aerial Structure

10 Year-Project in Full

Plan A

Description:

- Constructs new six lane facility between Spokane St. and Roy St.
- Removes existing Alaskan Way Viaduct
- Replaces Seattle's central waterfront seawall
- Constructs new elevated structure between King and Battery St.
- Replaces Battery Street Tunnel with 2-level cut-and-cover tunnel under Bell St. to Aurora Ave.
- Constructs new Spokane St. interchange and surface roadway to Holgate St.
- Reconstructs elevated structure from Holgate Street to King Street

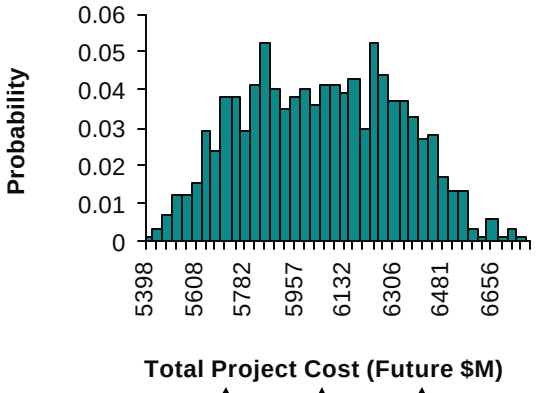
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2017-2019

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 5.7 Billion

There is a 50% chance the cost is less than $ 6.0 Billion

There is a 90% chance the cost is less than $ 6.4 Billion

Benefits this project would provide:

- Maintains current highway capacity
- Adds one lane in each direction in Battery Street Tunnel
- Reduces seismic risk exposure significantly
- Improves freight and commuter movements by building new Spokane St. interchange at SR 99, removing chokepoint at Battery Street Tunnel, and completing connections to I-90 via SR 519
- Increases safety by providing wider lanes and shoulders and increasing sight distances
- Improves access for ferry users by expanding holding area
- Reconnects neighborhoods by connecting the street grid near south Lake Union
- Maintains view of waterfront from aerial structure
- Expands commuter choices by increasing vanpools and employer commute reduction programs

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occurs increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Aerial and Tunnel

10 Year-Project in Full

Plan B

Description:

- Constructs new six lane facility between Spokane St. and Roy St.
- Removes existing Alaskan Way Viaduct
- Replaces Seattle's central waterfront seawall
- Replaces Battery Street Tunnel with two tunnels to Aurora Ave.
- Constructs new Spokane Street interchange and surface roadway to Holgate St.
- Reconstructs elevated structure from Holgate St. to King St.
- Constructs elevated structure for northbound traffic and tunnel for southbound traffic between Holgate St. and Battery St.

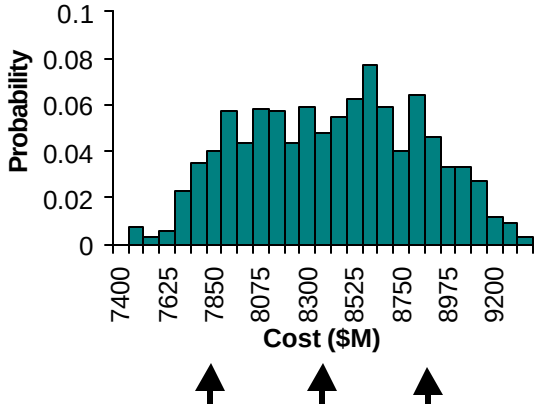
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2019-2021

Inflation escalation is to 2013, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 7.8 Billion

There is a 50% chance the cost is less than $ 8.4 Billion

There is a 90% chance the cost is less than $ 8.9 Billion

Benefits this project would provide:

- Maintains current highway capacity
- Adds one lane in each direction in Battery Street Tunnel
- Reduces seismic risk exposure significantly
- Improves freight and commuter movements by building new Spokane St. interchange at SR 99, removing chokepoint at Battery Street Tunnel, and completing connections to I-90 via SR 519
- Increases safety by providing wider lanes and shoulders and increasing sight distances
- Improves access for ferry users by expanding holding area
- Reconnects neighborhoods by connecting the street grid near south Lake Union
- Maintains view of waterfront from aerial structure
- Expands commuter choices by increasing vanpools and employer commute reduction programs

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.
- The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement
Tunnel

10 Year-Project in Full

Plan C

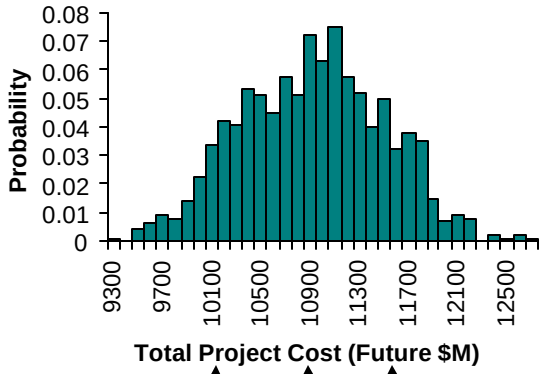
Description:
•Constructs new six lane facility between Spokane St. and Roy St.
•Removes existing Alaskan Way Viaduct
•Replaces Seattle's central waterfront seawall and replace existing viaduct with 6-lane stacked cut-and-cover tunnel
•Replaces Battery Street Tunnel with two tunnels to Aurora Ave.
•Constructs new Spokane St. interchange and surface roadway to Holgate St.
•Reconstructs elevated structure from Holgate St. to King St.

Schedule:
Begin Construction Range: 2006-2008

End Construction Range: 2018-2020

Inflation escalation is to 2013, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 10.1 Billion

There is a 50% chance the cost is less than $ 10.9 Billion

There is a 90% chance the cost is less than $ 11.6 Billion

Benefits this project would provide:

•Maintains current highway capacity
•Adds one lane in each direction in Battery Street Tunnel
•Reduces seismic risk exposure significantly
•Improves freight and commuter movements by building new Spokane St. interchange at SR 99, removing chokepoint at Battery Street Tunnel, and completing connections to I-90 via SR 519
•Increases safety by providing wider lanes and shoulders and increasing sight distances
•Improves access for ferry users by expanding holding area
•Reconnects neighborhoods by connecting the street grid near south Lake Union
•Expands commuter choices by increasing vanpools and employer commute reduction programs
•Improves central waterfront by building pedestrian promenade, creating open space, creating bicycle trails, and adding track for waterfront trolley

Risk issues that could impact project cost or schedule:

•Changes to national seismic design criteria increase structure costs.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
•Changes to environmental regulations increase project time and cost.
•Early stage of project development increases project scope uncertainty.
•Restrictions on when work in and around water can occur increase time to complete project.
•Complex construction in a dense downtown urban area increases cost and schedule.
•Utility relocations are greater than anticipated, which increase cost.
•More contaminated soils and groundwater exist than expected, which increase cost.
•The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Extended Tunnel

10 Year-Project in Full

Plan D

Description:

- Constructs new six lane facility between Spokane St. and Roy St.
- Removes existing Alaskan Way Viaduct
- Replaces Seattle's central waterfront seawall and replaces existing viaduct with 6-lane stacked cut-and-cover tunnel
- Replaces Battery Street Tunnel with stacked cut-and-cover tunnel to Aurora Ave. via Broad St.
- Constructs new Spokane St. interchange and surface roadway to Holgate St.
- Reconstructs elevated structure from Holgate St. to King St.

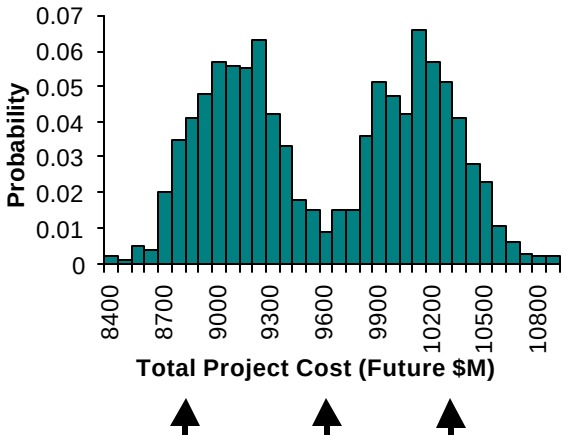
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2020-2022

Inflation escalation is to 2014, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 8.8 Billion

There is a 50% chance the cost is less than $ 9.6 Billion

There is a 90% chance the cost is less than $ 10.3 Billion

Benefits this project would provide:

- Maintains current highway capacity
- Adds one lane in each direction in Battery Street Tunnel
- Reduces seismic risk exposure significantly
- Improves freight and commuter movements by building new Spokane St. interchange at SR 99, removing chokepoint at Battery Street Tunnel, and completing connections to I-90 via SR 519
- Increases safety by providing wider lanes and shoulders and increasing sight distances
- Improves access for ferry users by expanding holding area
- Reconnects neighborhoods by connecting the street grid near south Lake Union
- Expands commuter choices by increasing vanpools and employer commute reduction programs
- Improves central waterfront by building pedestrian promenade, creating open space, creating bicycle trails, and adding track for waterfront trolley

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.
- The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design: Low | Medium | High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Rebuild Viaduct

10 Year-Project in Full

Rebuild

Description:

- Reconstructs existing viaduct, without widening lanes or adding shoulders
- Replaces Seattle's central waterfront seawall
- Upgrades Battery Street Tunnel to meet fire and life safety standards

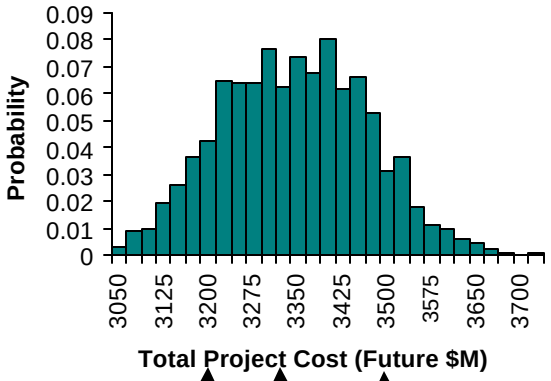
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2017-2019

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 3.2 Billion

There is a 50% chance the cost is less than $ 3.3 Billion

There is a 90% chance the cost is less than $ 3.5 Billion

Benefits this project would provide:

- Maintains current highway capacity
- Reduces seismic risk exposure significantly
- Increases safety in Battery Street Tunnel by providing improved fire and life safety systems
- Maintains view from aerial structure

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before rebuild, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-405, Tukwila to Lynnwood Additional Lanes

10 Year-Funding in Full

Description:

•Adds two new lanes in each direction, with truck climbing lanes
•Adds new bus rapid transit system, HOV ramps, and park and ride lots throughout corridor
•Adds new and widens existing arterials

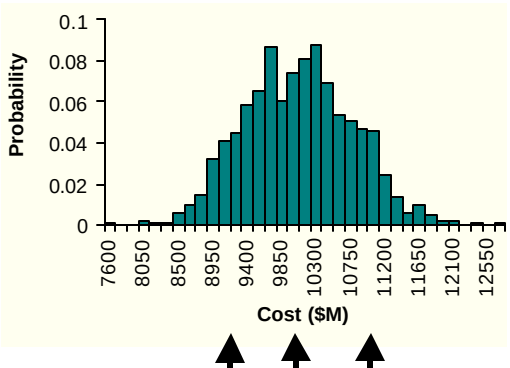
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2013 - 2016

Inflation escalation is to 2010, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 9.1 Billion

There is a 50% chance the cost is less than $ 10.0 Billion

There is a 90% chance the cost is less than $ 10.9 Billion

Benefits this project would provide:

•Reduces vehicle travel by over 13 million hours per year
•Reduces congestion by 20% and accommodates additional 110,000 person trips per day in the corridor
•Decreases accidents through congestion reduction
•Improves quality and quantity of local and regional transit service, expanding current transit service by over 50%
•Adds 5,000 new park and ride spaces to the existing 9,500 spaces in the corridor
•Reduces the number of cars driven during rush hour through travel demand management strategies such as expanding the vanpool fleet by 1,700 vehicles and expanding employer commute trip reduction programs
•Improves environmental quality by reducing water pollution from stormwater and adding noise walls

Risk issues that could impact project cost or schedule:

•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Early stage of project development increases project scope uncertainty.
•Interchange design and freeway connections are complex and difficult to construct, which could increase time and cost.
•Changes to national seismic design criteria increase structure costs.
•Legal challenges and delays in obtaining environmental permits result in project delay.
•Extended time may be needed to negotiate and relocate utilities.
•Delays may occur from cities and counties on project scope components may occur.

Level of Project Design: Low | Medium | High

June 3, 2002

Washington State Department of Transportation

SR 520 Trans-Lake Washington Project (Seattle to Redmond, 4-Lanes)

10 Year-Project in Full

4-Lanes

Description:

- Rebuilds existing four lane freeway between Seattle and Redmond
- Includes replacement of SR 520 floating bridge, approaches, and Portage Bay bridge
- Adds expanded roadway shoulders and bicycle and pedestrian lanes

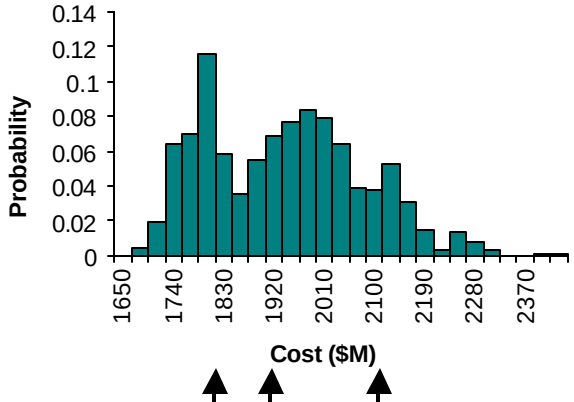
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2014 - 2016

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.8 Billion

There is a 50% chance the cost is less than $ 1.9 Billion

There is a 90% chance the cost is less than $ 2.1 Billion

Benefits this project would provide:

- Maintains current highway capacity
- Decreases seismic and storm damage risk exposure significantly
- Increases safety and operational reliability with added standard shoulders and lane widths
- Reduces HOV travel times with new SR 520 to I-5 express lanes connection
- Expands commuter choices by increasing vanpools and employer commute reduction programs
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria result in more expensive structures.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge result in increased complexity and expense.
- Legal challenges and delays in obtaining environmental permits results in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 520 Trans-Lake Washington Project (Seattle to Redmond, 6-Lanes)

10 Year-Project in Full

6-lanes

Description:

- Reconstructs and expands SR 520 to six lanes between Seattle and Redmond (adds one HOV/bus rapid transit lane each direction)
- Replaces SR 520 floating bridge, approaches, and Portage Bay bridge
- Adds expanded roadway shoulders, bicycle and pedestrian lanes
- Includes five 300-500-foot lidded sections of freeway

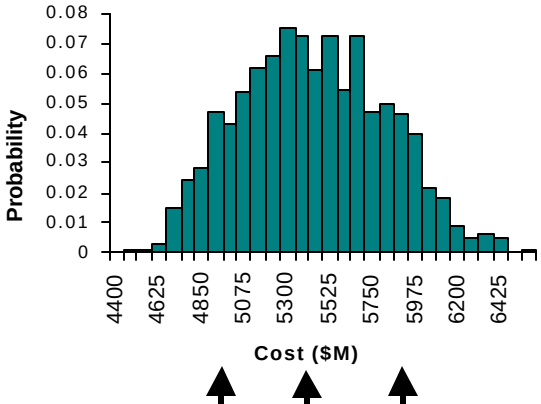
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2014 - 2016

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 4.9 Billion

There is a 50% chance the cost is less than $ 5.4 Billion

There is a 90% chance the cost is less than $ 5.9 Billion

Benefits this project would provide:

- Expands current highway capacity by adding an HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
- Improves freeway flow and improves safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff quality
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84th Ave. NE, and 92nd Ave. NE southbound I-5 Ship Canal weave
- Addresses southbound I-5 Mercer weave

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits result in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 520 Trans-Lake Washington Project (Seattle to Redmond, 8-Lanes)

10 Year-Project in Full

8-Lanes

Description:

•Reconnects and expands SR 520 to eight lanes between Seattle and Redmond (adds one general purpose and one HOV/bus rapid transit lane in each direction)
•Replaces SR 520 floating bridge, approaches, and Portage Bay bridge
•Adds expanded roadway shoulders and bicycle and pedestrian lanes
•Includes five 300-500-foot lidded sections of freeway

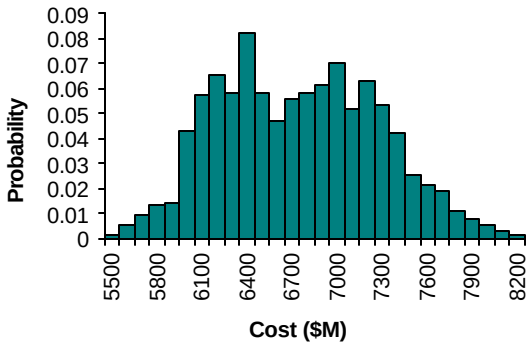
Schedule:

Begin Construction Range: 2005 - 2008

End Construction Range: 2016 - 2018

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 6.0 Billion

There is a 50% chance the cost is less than $ 6.7 Billion

There is a 90% chance the cost is less than $ 7.4 Billion

Benefits this project would provide:

•Expands highway capacity by adding one general purpose and one HOV/bus rapid transit lane in each direction
•Increases safety and reliability with added standard shoulders and lane widths
•Decreases potential seismic and storm damage risk
•Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
•Improves freeway flow and improve safety with removal of traffic weaves at SR 520/I-405 interchange
•Addresses southbound I-5 Ship Canal weave and southbound I-5 Mercer weave
•Adds noise walls and improves water runoff management
•Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
•Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
•Reduces the number of cars driven during rush hour through travel demand management strategies such as expanding the vanpool fleet and expanding employer commute trip reduction programs
•Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84th Ave. NE, and 92nd Ave. NE

Risk issues that could impact project cost or schedule:

•Changes to national seismic design criteria increase structure costs.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
•Changes to environmental regulations increase project time and cost.
•Special stormwater treatment facilities for the floating bridge increase complexity and expense.
•Legal challenges and delays in obtaining environmental permits results in project delay.
•Early stage of project development increases project scope uncertainty.
•Restrictions on when work in and around water can occur increases time to complete project.
•Potential conflicts with Sound Transit LINK construction at Pacific Street could result in project delay.
•I-405/SR 520 interchange design is complex and difficult to construct, which could increase time and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 509, Federal Way to SeaTac, Corridor Completion I-5/South Airport Access

10 Year-Project in Full

Description:

- Completes SR 509 as a six lane freeway, with HOV lanes, between I-5 and S 188th St. in SeaTac
- Adds new lanes on I-5 from S 320th in Federal Way to 200th and improves interchanges
- Completes the South Access Expressway to Sea-Tac International Airport

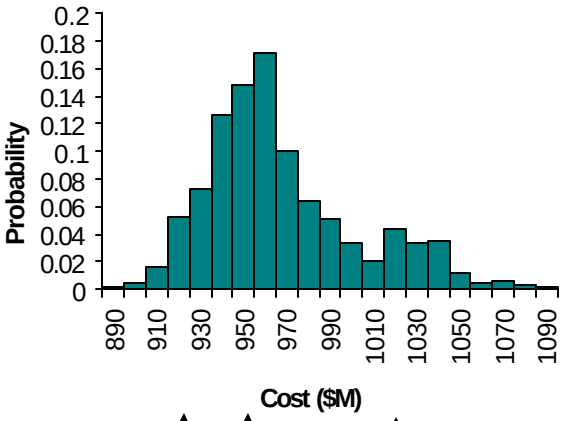
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2011 - 2013

Inflation escalation is to 2009, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 920 Million

There is a 50% chance the cost is less than $ 950 Million

There is a 90% chance the cost is less than $ 1.02 Billion

Benefits this project would provide:

- Completes SR 509 and connects it to I-5; provides a direct connection between Seattle and South King County, and completes an alternative north-south corridor to I-5
- Improves freight mobility within the State's most traveled freight corridor, critical to the State's economic growth
- Provides direct southern access to Sea-Tac, the hub airport for the Pacific Northwest
- Reduces congestion by diverting over 1,200 vehicles during the peak hour and 5,000 trucks per day from the I-5 Southcenter Hill
- Provides substantial peak-hour travel time savings between Seattle and Tacoma by adding over 5 miles of improvements to I-5 between S. 200th St. and S. 320th St., and opens up access to existing SR 509 north to the First Ave. South bridge
- Improves habitat and water quality in affected drainage basins

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Delays in right-of-way purchase results in later construction start and project cost increase.
- Additional costs could occur due to needed improvements at the I-5/S 272nd St. interchange.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 167, Tacoma to Puyallup
New Freeway Construction

10 Year-Project in Full

Description:

•Completes SR 167 from Puyallup to the Port of Tacoma with a six lane freeway
•Includes an HOV lane in each direction from SR 161 near Puyallup to I-5
•Includes four lanes between I-5 and SR 509 near the Port of Tacoma

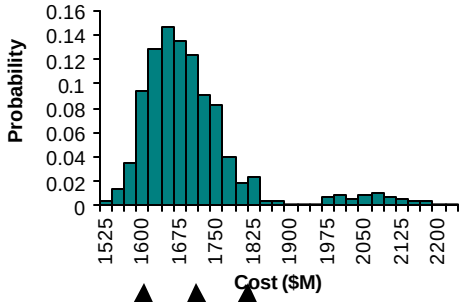
Schedule:

Begin Construction Range: 2005 - 2006

End Construction Range: 2010 - 2012

Inflation escalation is to year 2008, approximate midpoint construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.6 Billion

There is a 50% chance the cost is less than $ 1.7 Billion

There is a 90% chance the cost is less than $ 1.8 Billion

Benefits this project would provide:

•Provides a key link for freight to move to and from the Port of Tacoma
•Relieves congestion by offering commuters, travelers, and shippers an alternative to I-5
•Reduces congestion and improve safety on local roads by connecting SR 167 to I-5

Risk issues that could impact project cost or schedule:

•Project requires the acquisition of large amounts of property in a corridor where land is rapidly developing. Delays in acquiring new properties will result in significant cost increases to the project.
•Project will be constructed near Hylebos Creek, Wapato Creek, wetlands and wildlife habitat. Environmental permitting and mitigation requirements may change significantly between now and construction, tending to increase costs and cause delays.
•Project includes a major new interchange where Interstate 5 and SR 167 connect. Design of this interchange assumes Federal Highway Administration (FHWA) approval of a number of design features. If not approved by FHWA, changes in the design would result in increased cost and time for the project.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-5, SR 16, SR 167 – Tacoma/Pierce County HOV

10 Year-Project in Full

Description:

•Adds HOV lane in each direction on I-5 from SR 512 to King County line
•Adds HOV lane in each direction on SR 16 from I-5 to Purdy
•Adds HOV lane in each direction on SR 167 from Auburn to Puyallup

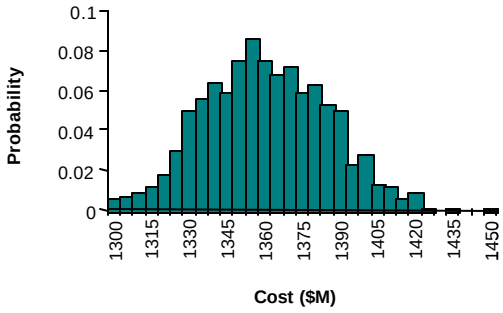
Schedule:

Begin Construction: 2003

End Construction Range: 2010-2011

Inflation escalation is to 2006, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.33 Billion

There is a 50% chance the cost is less than $ 1.36 Billion

There is a 90% chance the cost is less than $ 1.39 Billion

Benefits this project would provide:

•Increases speed and reliability for transit and HOV throughout Pierce County
•Encourages use of transportation options such as HOV lanes, park and ride lots, and transit
•Increases safety at I-5/SR 16 and in Tacoma Dome area by reconfiguring interchanges

Risk issues that could impact project cost or schedule:

•Project requires the acquisition of property in a corridor where land is rapidly developing. Delays in acquiring new properties will result in significant cost increases to the project.
•Estimate escalation rate less than current real estate market will likely increase right-of-way costs.
•Changes to national seismic design criteria increases structure costs.
•Poor soil conditions for Puyallup River Bridge foundations may increase project cost.
•Changes to environmental regulations increase project time and cost.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

US 395 North Spokane Corridor

10 Year-Funding in Full

Description:

•Constructs new six lane corridor from I-90 to US 395 at Wandermere

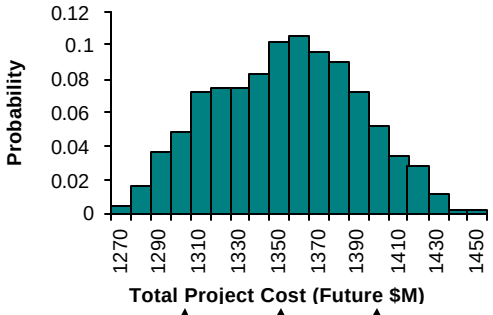
Schedule:

Begin Construction Range: 2004

End Construction Range: 2017 - 2018

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.3 Billion

There is a 50% chance the cost is less than $ 1.35 Billion

There is a 90% chance the cost is less than $ 1.4 Billion

Benefits this project would provide:

•Reduces travel time for freight and traffic by an estimated 2 million hours each year
•Improves air quality by reducing regional emissions by 2.4 million pounds of CO2 each year
•Decreases accidents
•Encourages use of transportation options such as HOV lanes, park and ride lots, and light rail right-of-way preservation
•Reduces congestion on local north-south arterials by building new corridor

Risk issues that could impact project cost or schedule:

•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•The project requires the acquisition of large amounts of property for right-of-way; therefore market conditions may increase the cost of acquiring right-of-way.
•Costs for aesthetic features adjacent to the neighborhoods, such as irrigation and landscaping, may increase.
•Poor soil conditions have been encountered in the corridor and additional areas may be encountered that would require mitigation.
•Review process of track realignment design by the Burlington Northern Santa Fe Railroad could delay project construction.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-90, Snoqualmie Pass East, Reconstruct and Add New Lanes

10 Year-Project in Full

Description:

•Widens I-90 east of Snoqualmie Pass to a six lane highway and repairs roadway from West Easton Interchange to east of Hyak

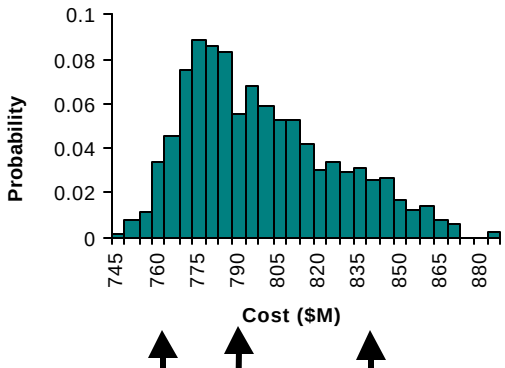
Schedule:

Begin Construction Range: 2005 - 2006

End Construction Range: 2012 - 2014

Inflation escalation is to year 2009, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 760 Million

There is a 50% chance the cost is less than $ 790 Million

There is a 90% chance the cost is less than $ 840 Million

Benefits this project would provide:

•Improves reliability for travel across Snoqualmie Pass by eliminating road closures caused by avalanches, rock falls, and localized flooding
•Improves safety by straightening sharp curves, increasing sight distance, and expanding chain-up areas
•Protects natural resources by building wildlife crossings at high priority locations and removing fish barriers at stream crossings
•Adds capacity for current and future travelers by adding a lane in each direction from West Easton Interchange to east of Hyak

Risk issues that could impact project cost or schedule:

•Complexity associated with design and construction of bridge foundations along Lake Keechelus could increase cost and schedule.
•Requirements for improving wildlife crossings could cause delays in environmental permitting and increase costs.
•Shortened construction seasons expected because of extreme weather conditions.
•Delays may occur in obtaining environmental permits.
•Changes to national seismic design criteria increases structure costs.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

10 Year Projects – Funding in Part

SR 99 Alaskan Way Viaduct and Seawall Replacement

Aerial Structure Phasing Option

10 Year-Project in Part

Plan A

Description:

- Provides temporary single-level aerial structure from King St. to Bell St.
- Reconstructs elevated structure from Holgate St. to King St.
- Replaces Seattle's central waterfront seawall
- Requires future phasing at additional and higher costs

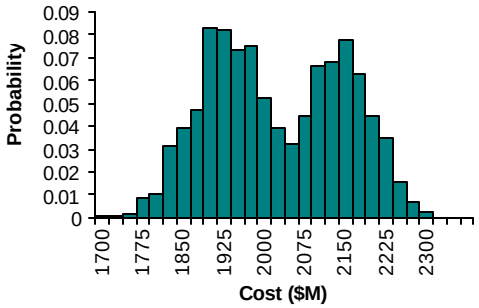
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2010-2012

Inflation escalation is to 2010, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.8 Billion

There is a 50% chance the cost is less than $ 2.0 Billion

There is a 90% chance the cost is less than $ 2.2 Billion

Benefits this project would provide:

- Improves highest risk area first along central waterfront
- Reduces seismic risk exposure significantly
- Improves access for ferry users by expanding holding area
- Expands commuter choices by increasing vanpools and employer commute reduction programs
- Moves traffic off viaduct to partially completed facility
- Replaces existing downtown connections at Columbia St. and Seneca St. with temporary ramps at King St.
- Maintains view of waterfront from aerial structure

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Aerial and Tunnel Phasing Option

10 Year-Project in Part

Plan B

Description:

- Reconstructs elevated structure from Holgate Street to King Street
- Replaces a segment of Seattle's central waterfront seawall as part of single-level cut-and-cover tunnel from King St. to Stewart St.
- Provides two (one unfinished) mined tunnels from Stewart St. to Roy St.
- Requires future phasing at additional and higher costs

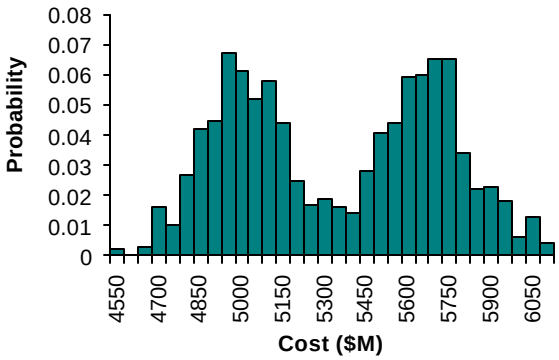
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2012-2014

Inflation escalation is to 2010, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 4.9 Billion

There is a 50% chance the cost is less than $ 5.3 Billion

There is a 90% chance the cost is less than $ 5.8 Billion

Benefits this project would provide:

- Improves highest risk area first along central waterfront
- Reduces seismic risk exposure significantly
- Improves access for ferry users by expanding holding area
- Moves traffic off viaduct to partially completed facility
- Replaces existing downtown connections at Columbia St. and Seneca St. with temporary ramps at King St.
- Maintains view of waterfront from south aerial structure
- Expands commuter choices by increasing vanpools and employer commute reduction programs

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- A limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Complex construction in a dense downtown urban area increases cost and schedule.
- Utility relocations are greater than anticipated, which increase cost.
- More contaminated soils and groundwater exist than expected, which increase cost.
- The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Tunnel Phasing Option

10 Year-Project in Part

Plan C

Description:

•Replaces a segment of Seattle's central waterfront seawall as part of two-level cut-and-cover tunnel from King St. to Stewart St.
•Provides temporary aerial connection from Stewart St. to existing Battery Street Tunnel
•Reconstructs elevated structure from Holgate St. to King St.

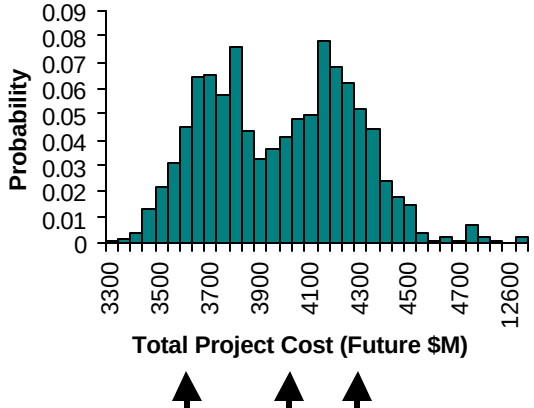
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2012-2014

Inflation Escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 3.6 Billion

There is a 50% chance the cost is less than $ 4.0 Billion

There is a 90% chance the cost is less than $ 4.3 Billion

Benefits this project would provide:

•Improves highest risk area first along central waterfront
•Reduces seismic risk exposure significantly
•Improves access for ferry users by expanding holding area
•Moves traffic off viaduct to partially completed facility
•Replaces existing downtown connections at Columbia St. and Seneca St. with temporary ramps at King St.
•Maintains view of waterfront from south aerial structure
•Expands commuter choices by increasing vanpools and employer commute reduction programs

Risk issues that could impact project cost or schedule:

•Changes to national seismic design criteria increase structure costs.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
•Changes to environmental regulations increase project time and cost.
•Early stage of project development increases project scope uncertainty.
•Restrictions on when work in and around water can occur increase time to complete project.
•Complex construction in a dense downtown urban area increases cost and schedule.
•Utility relocations are greater than anticipated, which increase cost.
•More contaminated soils and groundwater exist than expected, which increase cost.
•The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 99 Alaskan Way Viaduct and Seawall Replacement

Extended Tunnel Phasing Option

10 Year-Project in Part

Plan D

Description:

•Replaces Seattle's central waterfront seawall as part of two-level cut-and-cover tunnel from King St. to Stewart St.
•Provides two-level cut-and-cover tunnel along Broad St. to Aurora Ave.
•Provides elevated structure from Holgate St. to King St.

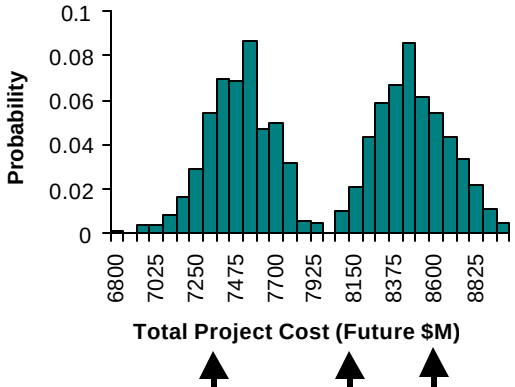
Schedule:

Begin Construction Range: 2006-2008

End Construction Range: 2016-2018

Inflation escalation is to 2012, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 7.3 Billion

There is a 50% chance the cost is less than $ 8.1 Billion

There is a 90% chance the cost is less than $ 8.6 Billion

Benefits this project would provide:

•Improves highest risk area first along central waterfront
•Reduces seismic risk exposure significantly
•Improves access for ferry users by expanding holding area
•Moves traffic off viaduct to partially completed facility
•Replaces existing downtown connections at Columbia St. and Seneca St. with temporary ramps at King St.
•Maintains view of waterfront from south aerial structure
•Expands commuter choices by increasing vanpools and employer commute reduction programs

Risk issues that could impact project cost or schedule:

•Changes to national seismic design criteria increase structure costs.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Catastrophic failure of viaduct and seawall occurs before replacement, which results in a more expensive emergency replacement.
•Changes to environmental regulations increase project time and cost.
•Early stage of project development increases project scope uncertainty.
•Restrictions on when work in and around water can occur increase time to complete project.
•Complex construction in a dense downtown urban area increases cost and schedule.
•Utility relocations are greater than anticipated, which increase cost.
•More contaminated soils and groundwater exist than expected, which increase cost.
•The complexity of constructing tunnels near the water, in contaminated soils, and under high rise buildings, may increase schedule and cost.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-405, Tukwila to Lynnwood Additional Lanes

Option A – Completes Sea-Tac Airport to Bellevue with Kirkland Improvements

10 Year-Funding in Part

Description:

•Adds up to two lanes in each direction from Sea-Tac Airport to Bellevue with truck climbing lanes
•Adds lanes to SR 167 from S 180th St to I-405
•Adds a lane each direction through Kirkland
•Implements bus rapid transit with transit centers and HOV direct access ramps from Lynnwood to Burien
•Builds new arterials
•Expands the vanpool program
•Requires future phasing at additional and higher costs

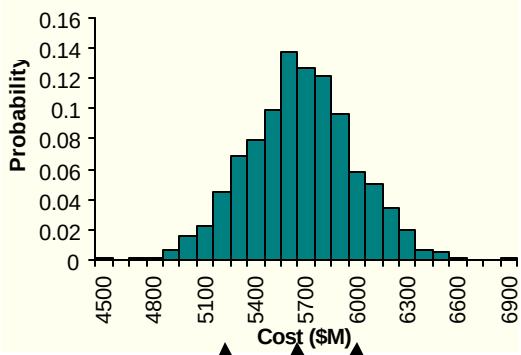
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2013 - 2016

Inflation escalation is to 2010, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 5.2 Billion

There is a 50% chance the cost is less than $ 5.6 Billion

There is a 90% chance the cost is less than $ 6.0 Billion

Benefits this project would provide:

• Addresses most congested areas first
• Builds a complete segment from Sea-Tac International Airport to the new Bellevue Access ramps
•Provides incremental one lane addition each way in Kirkland from 70th Street to 128th Street with new interchange at 132nd
•Implements Bus Rapid Transit system from Lynnwood to Burien and Kent, along with expanded express bus service
•Constructs 4000 new park & ride stalls from Burien to Canyon Park
•Implements an aggressive transportation demand management program including over 1700 new vanpools
•Adds key arterial HOV and transit priority improvements
•Constructs new arterial connections on 132nd Street in Kirkland, and Willows Road from Redmond to Woodinville and Bothell

Risk issues that could impact project cost or schedule:

•Limited number of contractors are qualified and available to pursue a project this large, increasing contact costs and project delays.
•Right-of-way cost escalation will occur due to real estate market variations.
•Engineering is at a preliminary level, leading to many variables in the design of complex interchanges.
•Changes to national seismic design criteria increase structure costs.
•Challenges to early-action mitigation plan dealing with floodplain / habitat mitigation.
•Additional work scope to is needed to address connecting freeways.
•Extended time is needed to negotiate and relocate utilities.
•Delays are possible from cities and counties on project scope components.
•Legal challenges may be expected to environmental documents.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-405, Tukwila to Lynnwood Additional Lanes

Option B – Completes SR 167 Interchange Area with Bellevue and Kirkland Improvements

10 Year Funding in Part

Description:

•Adds lanes on I-405 from SR 181 to SR 169 including rebuilding the SR 167 interchange
•Adds lanes to SR 167 from S 180th St to I-405
•Adds lanes to southbound I-405 from SE 8th to I-90
•Adds a lane northbound from Lake Wash Blvd. to I-90
•Adds a lane in each direction in the Totem Lake area

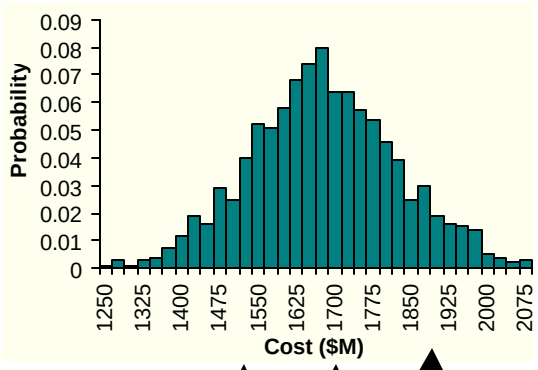
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2011 - 2014

Inflation escalation is to 2009, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.5 Billion

There is a 50% chance the cost is less than $ 1.7 Billion

There is a 90% chance the cost is less than $ 1.9 Billion

Benefits this project would provide:

•Addresses most congested areas first in corridor in the areas of Renton, South Bellevue, and the Totem Lake area of Kirkland
•Provides improvements that can be connected to in follow-on projects
•Develops the preliminary engineering and environmental documents from Sea-Tac to Bothell to allow faster follow-on construction when funded
•Puts in place advanced environmental mitigation to allow for follow-on construction when funded

Risk issues that could impact project cost or schedule:

•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
•Delays in right-of-way purchase result in later construction start and project cost increases.
•Early stage of project development increases project scope uncertainty.
•Interchange design and freeway connections are complex and difficult to construct, which could increase time and cost.
•Changes to national seismic design criteria increase structure costs.
•Legal challenges and delays in obtaining environmental permits results in project delay.
•Extended time may be needed to negotiate and relocate utilities.
•Delays from cities and counties on project scope components may occur.

Level of Project Design: Low | Medium | High

June 3, 2002

Washington State Department of Transportation

SR 520 Trans-Lake Washington Project (Seattle to Medina, 6-Lanes)

Phasing Option

10 Year-Project in Part

6-lanes

Description:

- Expands SR 520 to six lanes
- Replaces SR 520 floating bridge, Portage Bay bridge, and approaches from east of Montlake Blvd. to 80th Ave. (one HOV/bus rapid transit lane in each direction)
- Adds expanded roadway shoulders and bicycle and pedestrian lanes
- Includes one 300-500-foot lidded section of freeway

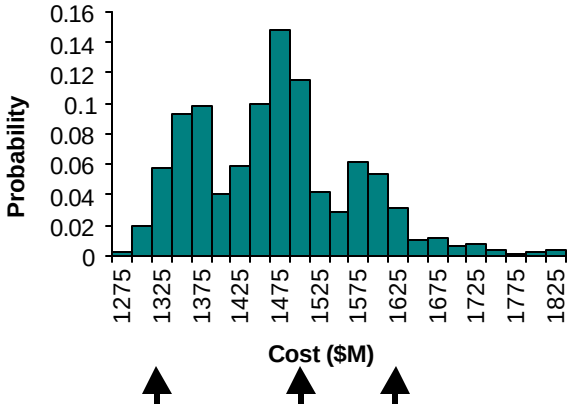
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2015 - 2017

Inflation escalation is to 2011, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.3 Billion

There is a 50% chance the cost is less than $ 1.5 Billion

There is a 90% chance the cost is less than $ 1.6 Billion

Benefits this project would provide:

- Extends westbound HOV lane across lake to Montlake Blvd.
- Provides HOV/bus rapid transit bypass lane for eastbound traffic across lake
- Expands current highway capacity by adding HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
- Improves freeway flow and improve safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff management
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84th Ave. NE, and 92nd Ave. NE
- Addresses southbound I-5 Ship Canal weave and southbound I-5 Mercer weave

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits result in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Delays in right-of-way purchase results in later construction start and project cost increases.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 520 Trans-Lake Washington Project (Seattle to Medina, 8-Lanes)

Phasing Option

10 Year-Project in Part

8-Lanes

Description:

- Expands SR 520 to eight lanes
- Replaces SR 520 floating bridge, Portage Bay bridge, and approaches from east of Montlake Blvd. to 80th Ave. (one HOV/bus rapid transit lane in each direction)
- Adds expanded roadway shoulders and bicycle and pedestrian lanes
- Includes one 300-500-foot lidded section of freeway

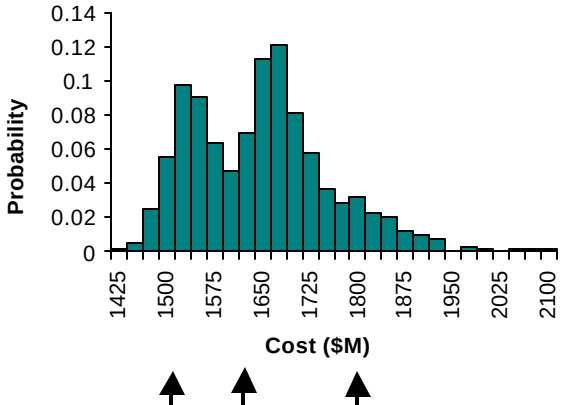
Schedule:

Begin Construction Range: 2005 - 2008

End Construction Range: 2016 - 2018

Inflation escalation is to 2012, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 1.5 Billion

There is a 50% chance the cost is less than $ 1.6 Billion

There is a 90% chance the cost is less than $1.8 Billion

Benefits this project would provide:

- Extends westbound HOV lane across lake to Montlake Blvd.
- Provides HOV/bus rapid transit bypass lane for eastbound traffic across lake
- Expands current highway capacity by adding HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
- Improves freeway flow and improves safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff management
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84th Ave. NE, and 92nd Ave. NE
- Addresses southbound I-5 Ship Canal weave and southbound I-5 Mercer weave

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits result in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.
- Delays in right-of-way purchase results in later construction start and project cost increases.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 509, Federal Way to SeaTac, Corridor Completion

Option A – Partial SR 509 Connection with I-5 Interchange and South Access

10 Year-Project in Part

Description:

- Constructs half of SR 509 (one lane each direction) from S 188th Street to the South Access Expressway
- Connects SR 509 and I-5 with the proposed new South Access Expressway to the airport
- Provides tunnel connections to I- 5, and constructs collector-distributor lanes on I-5 to the SR 516 interchange
- Completes engineering and purchases all right-of-way for the corridor

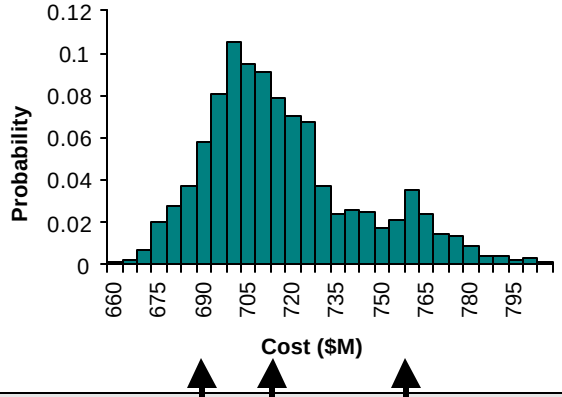
Schedule:

Begin Construction Range: 2005 - 2007

End Construction Range: 2011 - 2012

Inflation escalation is to 2008, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 690 Million

There is a 50% chance the cost is less than $ 710 Million

There is a 90% chance the cost is less than $ 760 Million

Benefits this project would provide:

- Purchases all the right-of-way for the corridor
- Provides for construction of a two lane SR 509 connection from S 188th St. to the South Access Expressway, allowing the connection with I-5
- Improves freight mobility by allowing a new alternate route on SR 509, avoiding the Southcenter Hill
- Constructs the South Access Expressway (by the Port of Seattle) from SR 509 to the airport drive system, providing direct southern access
- Improves habitat and water quality in affected drainage basins by constructing environmental mitigation features

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- A limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Delays in right-of-way purchase result in later construction start and project cost increase.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 509, Federal Way to SeaTac, Corridor Completion

Option B – S 188th to SR 99

10 Year-Project in Part

Description:

- Constructs extension of SR 509 from S 188th St. on new alignment to interim intersection with SR 99/International Boulevard
- Completes engineering and purchases all needed right-of-way for complete corridor

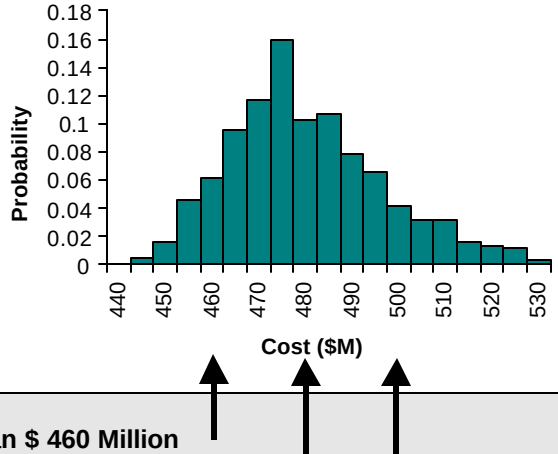
Schedule:

Begin Construction Range: 2004 - 2006

End Construction Range: 2011 - 2012

Inflation escalation is to 2008, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 460 Million

There is a 50% chance the cost is less than $ 480 Million

There is a 90% chance the cost is less than $ 500 Million

Benefits this project would provide:

- Purchases all the right-of-way for the corridor
- Provides for construction of a four lane SR 509 connection from S 188th St. to an interim intersection with SR 99, a primary state highway
- Provides improvements that can be connected to in follow-on construction when funded
- Improves habitat and water quality in affected drainage basins by constructing environmental mitigation features

Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- A limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Delays in right-of-way purchase results in later construction start and project cost increases.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

SR 167, Tacoma to Puyallup

New Freeway Construction

I-5 to SR 509 Phasing Option

10 Year-Project in Part

Description:

•Constructs a four lane freeway, SR 167, from I-5 to SR 509 near the Port of Tacoma
•Completes the design and purchases the right-of-way for the entire project corridor

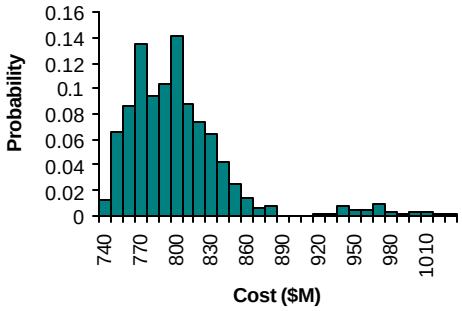
Schedule:

Begin Construction Range: 2005 - 2006

End Construction Range: 2009 - 2011

Inflation escalation is to 2008, approximate midpoint construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 750 Million

There is a 50% chance the cost is less than $ 790 Million

There is a 90% chance the cost is less than $ 840 Million

Benefits this project would provide:

•Provides a key link for freight to move to and from the Port of Tacoma
• Reduces congestion and improve safety on 54th Ave., Port of Tacoma Rd., and Pacific Highway in Fife
• Reduces future costs by purchasing property prior to future development

Risk issues that could impact project cost or schedule:

•Project requires the acquisition of large amounts of property in a corridor where land is rapidly developing. Delays in acquiring new properties will result in significant cost increases to the project.
•Project will be constructed near Hylebos Creek, wetlands and wildlife habitat. Environmental permitting and mitigation requirements may change significantly between now and construction, tending to increase costs and cause delays.
•Project includes a major new interchange where I-5 and SR 167 connect. The design of this interchange assumes Federal Highway Administration (FHWA) approval of a number of design features. If not approved by FHWA, changes in the design would result in increased cost and time for the project.
•Funding levels or staging that postpone the purchase of property for the entire corridor may jeopardize the SR 167 project between I-5 and Puyallup. Dense development may drive property costs to the point that the project is not affordable.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-5, SR 16, SR 167 – Tacoma/Pierce County HOV

Option A – SR 16 to King County
I-5 to Gig Harbor

10 Year-Project in Part

Description:

•Adds HOV lane in each direction on I-5 from SR16 interchange to King County line
•Adds HOV lane in each direction on SR 16 from I-5 to Gig Harbor

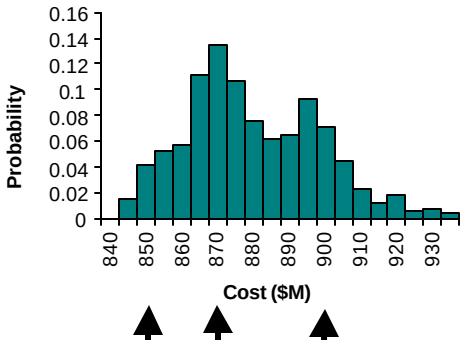
Schedule:

Begin Construction: 2003

End Construction Range: 2010-2011

Inflation escalation is to 2007, approximately midpoint year of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 850 Million

There is a 50% chance the cost is less than $ 870 Million

There is a 90% chance the cost is less than $ 900 Million

Benefits this project would provide:

•Increases speed and reliability for transit and HOV throughout Pierce County
•Encourages use of transportation options such as HOV lanes, park and ride lots, and transit
•Increases safety at I-5/SR 16 and in Tacoma Dome area by reconfiguring interchanges

Risk issues that could impact project cost or schedule:

•This project requires the acquisition of property in a corridor where land is rapidly developing. Delays in acquiring new properties will result in significant cost increases to the project.
•Estimate escalation rate less than current real estate market will likely increase right-of-way costs.
•Changes to national seismic design criteria increases structure costs.
•Poor soil conditions for Puyallup River Bridge foundations may increase project cost.
•Changes to environmental regulations increase project time and cost.
•Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-5, SR 16, SR 167 – Tacoma/Pierce County HOV

Option B -- Fife to King County Line, Union Avenue to Gig Harbor

10 Year-Project in Part

Description:

- Adds HOV lane in each direction on I-5 from Fife, Port of Tacoma Interchange to King County line
- Adds HOV lane in each direction on SR 16 from Gig Harbor to Union Ave. interchange near I-5
- Continues re-construction of the SR16/I-5 interchange

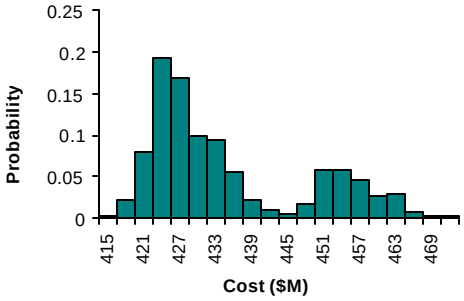
Schedule:

Begin Construction: 2003

End Construction: 2008-2009

Inflation escalation to 2005, approximately midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 420 Million

There is a 50% chance the cost is less than $ 430 Million

There is a 90% chance the cost is less than $ 460 Million

Benefits this project would provide:

- Increases speed and reliability for transit and HOV users
- Encourages use of transportation options such as HOV lanes, park and ride lots, and transit
- Increases safety at I-5/SR 16 interchange vicinity by reconfiguring the interchange

Risk issues that could impact project cost or schedule:

- This project requires the acquisition of property in a corridor where land is rapidly developing. Delays in acquiring new properties will result in significant cost increases to the project.
- Changes to national seismic design criteria increases structure costs.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

US 395 North Spokane Corridor

10 Year-Funding in Part

Description:

•Constructs 3.5 miles of four lane divided highway on the north portion of the 10.5-mile North Spokane Corridor between Hawthorne Rd. and US 395 at Wandermere
•Includes connection to US 2, structures, pedestrian/bicycle trail, and one mile of grading from Gerlach Rd. to Hawthorne Rd.
•Purchases all remaining right-of-way from Gerlach Rd. to Wandermere

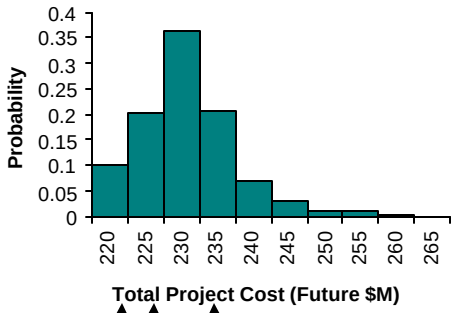
Schedule:

Begin Construction Range: 2004

End Construction Range: 2007 - 2008

Inflation escalation is to 2006, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 222 Million

There is a 50% chance the cost is less than $ 226 Million

There is a 90% chance the cost is less than $ 236 Million

Benefits this project would provide:

•Carries over 3.7 million tons of NAFTA commodities annually through Spokane
• Saves an estimated 1.7 million gallons of gas annually
• Improves air quality by reducing regional emissions by 2.4 million pounds of CO2 each year
• Improves safety by accident reduction
• Creates an estimated 750 jobs in Washington and 1250 jobs per year nationwide
• Encourages alternate transportation options by providing HOV lanes, park and ride lots, and reserving space for light rail
• Reduces travel time by an estimated 2 million hours each year
• Attracts motorists from local arterials, reducing traffic through neighborhoods

Risk issues that could impact project cost or schedule:

•Since this project requires the acquisition of large amounts of property for right-of-way, market conditions may increase the cost of acquiring right-of-way.
•Poor soil conditions have been encountered in the corridor and additional areas may be encountered that would require mitigation.
• Review process of track realignment design by the Burlington Northern Santa Fe Railroad could delay project construction.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

I-90, Snoqualmie Pass East, Reconstruct and Add New Lanes

10 Year-Project in Part

Description:

•Constructs first phase of work within a 15-mile corridor
•Widens I-90 to a six-lane facility and repairs roadway
•Improves avalanche protection at the existing snowshed.

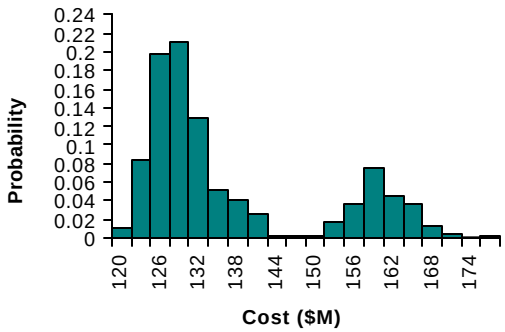
Schedule:

Begin Construction Range: 2005 - 2006

End Construction Range: 2007 - 2008

Inflation escalation is to 2007, approximate midpoint of construction

CEVP Result:



Project Cost Range

There is a 10% chance the cost is less than $ 120 Million

There is a 50% chance the cost is less than $ 130 Million

There is a 90% chance the cost is less than $ 160 Million

Benefits this project would provide:

•Replaces 2.3 miles of cracked and deteriorated pavement
•Minimizes road closures for avalanche control and avalanche removal along Lake Keechelus
•Straightens curves and increases sight distance.
•Extends the 6-lane roadway from Hyak through the first section of the corridor
•Expands chain-on and chain-off areas
•Provides a wildlife crossing at Gold Creek

Risk issues that could impact project cost or schedule:

•Design and constructability problems of foundation systems for bridges along Lake Keechelus.
•Requirements for improving wildlife crossings could cause delays in environmental permitting and increase costs.
•Shortened construction seasons expected because of extreme weather conditions.
•Delays in obtaining environmental permits.
•Changes to national seismic design criteria increases structure costs.

Level of Project Design:

Low — Medium — High

June 3, 2002

Washington State Department of Transportation

News Articles

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SEATTLE POST-INTELLIGENCER | SUNDAY, JUNE 9, 2002

P-I OPINION

Highway costs aren't what's shocking

Giving citizens a range of costs, including full disclosure of the variables, "is not only politically smart, but it's common sense," says consultant John Reilly, who helped the Department of Transportation estimate the cost of several proposed transportation projects.

The state Department of Transportation has delivered an updated estimate of how much it will cost to build key transportation projects around the state. It's caused some sticker shock: The decade of transportation construction catch-up will cost plenty.

Anyone registering genuine shock at a price between $17 billion and $33 billion to do these so-called mega projects simply hasn't been paying attention. We've been digging ourselves into this hole for decades. It should come as no surprise that we're going to have to shovel tons of money to dig our way out.

Even these huge projects will only begin to whittle away at the state's well-documented $100 million or more backlog of transportation construction and maintenance. And that estimate was made before the Nisqually Quake shook the dickens out of the Alaskan Way Viaduct.

The shock of paying for overdue transportation projects could have been softened if the governor, the Legislature and the voters had lived up to their civic obligations to the state transportation system. Referendum 49 in 1998 authorized the largest package of transportation projects in the state's history.

But that stood only until the passage of Initiative 695 the next year expressed the voters' unhappiness with the funding source for that transportation package – the Motor Vehicle Excise Tax. Gov. Gary Locke then led the legislative lemmings to repeal the MVET, leaving the projects unfunded.

Shocking or not, the Department of Transportation has performed an unprecedented public service with these latest cost estimates. It is a much-needed dose of fiscal reality. The department offered realistic cost-range estimates. Those estimates were made more accurate by factoring in inflation over time, potential environmental and seismic requirements, escalating land acquisition costs, even possible litigation costs.

Under such scrutiny, the projected costs of these projects grew, some dramatically.

If there is any reason to be shocked, it is by how much the funding proposed on the November ballot falls short.

Washington voters will be asked then to approve a statewide package of fees and a phased-in 9-cent gasoline tax increase that will raise an estimated $7.7 billion over the next 10 years.

Voters in King, Pierce and Snohomish counties may be asked in November to approve an additional package of taxes and fees to raise about $11.5 billion in the region over the next 10 years. The three counties' executives have proposed that nearly $1 billion of that regional money go to expand Sound Transit's light-rail line. That would leave about $10.5 billion for all the other regional projects.

The newly estimated costs of completing the key regional projects (the Alaskan Way Viaduct replacement, expanding and improving Interstate-405, Highways 520, 509 and 167) total between $16.6 billion and $32.7 billion. The state package will fund projects across the state, but even if all the money from the state and regional packages (minus Sound Transit's $1 billion) were spent on those five regional projects, it would barely cover the low-ball estimates and just over half of the highball figures.

The shortfall shock is worse project by project.

The Alaskan Way Viaduct project, depending on the configuration, could cost between $3.2 billion and $11.6 billion. But the project would get just $2 billion from the regional revenue package and only $450 million from the state package.

The I-405 project could cost between $9.1 billion and $10.9 billion, but only $1.5 billion in regional funding and $1.8 billion in state funding are proposed.

Where will the rest of the money come from?

There may be some federal funding available, bu federal support for such a roads-heavy project list is problematic.

Tolls on the new lanes, especially variable-rate, congestion-sensitive tolls, could produce revenue and regulate congestion, but only if elected officials have the political courage to use them.

The only remaining choices would be bad ones: Do fewer projects, do smaller projects or do them in phases, hoping for voter approval of additional fund ing later.

The prudent solution is to prioritize and do the best with the money available. That would mean picking the one, two or three most crucial regional projects, doing them first, and doing them right.

Eliminating or downsizing projects, of course, ha political pitfalls. Elected officials will be leery of voting for a package that offers insufficient transportation benefits to their constituents.

What should come as a shock to few is that politi cal leadership has failed. The repeated error on transportation funding in this state is asking for too little too late.

THE SPOKESMAN-REVIEW.COM

Monday, June 10, 2002

COMMENTARY

Support statewide road work, voters

John Webster - For the editorial board

The Washington state Department of Transportation unveiled some tire-popping cost estimates last week. It's a good thing, too.

The estimates convey a couple of important messages that probably got lost amid the sticker shock.

First, the cost estimates resulted from a transportation department effort to plan more accurately and manage money more effectively. This is what Washington's voters have been demanding, after all, before they'd approve tax money for highways. Cost overruns have discredited the Seattle area's effort to build a modern transit system. Given the long list of congested roads and delayed highway improvement needs around the state, inaccurate cost estimates would be debilitating as Washington considers the large investments its transportation system requires.

Visit the DOT's Web site (www.wsdot.wa.gov), and you'll see what we mean. State planners have identified a staggering list of highway improvement projects. Many are in Western Washington. Many others are in the eastern two-thirds of the state. The supply of money is limited and must be allocated fairly, to all regions. This requires good cost estimates.

To achieve good estimates, DOT developed what it calls "cost estimate validation process." It was this process that led to last week's estimates. The new process enlists teams of engineers to develop project time lines, anticipate problems and identify options. One goal is to prevent bidders on highway construction projects from taking the state for a ride, as contractors on large projects occasionally have done in other parts of the country. Another goal is to be realistic by using cost ranges, which highlight the fact that project modifications can have a big impact.

The new estimates, for some projects, are stunning. For others, such as Spokane's North-South freeway corridor, the estimates are close to earlier expectations. In any case, when the public reads that Interstate 405 around Seattle needs $9 billion to $11billion or that Seattle's Alaskan Way Viaduct needs $3.2 billion to $11.6 billion, it means the state should have fewer surprises later in the game and can make better decisions now.

Second, these estimates hold particular significance here in Eastern Washington. Western Washington's roads could gobble every dime the transportation budget contains -- unless Eastern Washington voters support the effort by the Legislature and the Transportation Department to create a funding system that does include dollars for all areas of Washington.

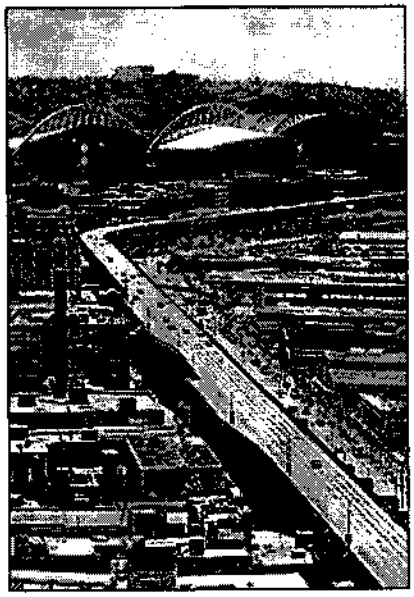
Don't let the cost estimates make you despair and vote no. Killing the statewide transportation funding program that will appear on this fall's ballot would only shift the focus to the Puget Sound, where attention is guaranteed.

The best approach, and the one the Legislature has crafted, combines a statewide funding package with an option for additional, regional funding packages. The Puget Sound area's needs are so great that in addition to the aid it would get from a statewide package, it can impose additional taxes, levied only in Puget Sound counties, for its extraordinary projects.

This is a balanced solution. So give the DOT some credit for those intimidating estimates. They should show us that it's way past time to pass a funding package and get to work. Delay will only increase the cost.

John Webster/For the editorial board

Sticker shock: Cost estimates for highway projects skyrocket



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ELLEN M. BANNER / THE SEATTLE TIMES

Alaskan Way Viaduct: $3.2 billion to $11.6 billion

By Eric Pryne
Seattle Times staff reporter

The state Department of Transportation yesterday unveiled its first semisolid cost estimate for replacing Seattle's aging Alaskan Way Viaduct.

It's a whopper.

Depending on the option chosen and an assortment of other variables, the price tag could be anywhere from $3.2 billion to $11.6 billion, the agency said.

The department also released updated cost estimates for three other high-profile "mega-projects" in King County, information that county officials have been awaiting eagerly as they attempt to piece together a regional transportation-improvement package, perhaps to submit to voters this fall.

The new numbers — all eye-popping — reinforce what most politicians have been saying for weeks: Even if voters approve both the regional plan and a statewide transportation package already slated for the November ballot, there won't be enough money to do everything everyone wants.

Competition for that money is likely to intensify.

"You're looking at $10 billion for a $30 billion problem," said Metropolitan King County Councilman Dwight Pelz, D-Seattle, one of the key figures in the regional negotiations. "We have to put the transportation dreams of King County on a budget."

"We're going to have to do a lot of balancing here," added Councilman Rob McKenna, R-Bellevue, another prominent player.

The Transportation Department estimated that:

• Proposed improvements to the Interstate 405 corridor, including two new freeway lanes in each direction from Tukwila to Lynnwood, could cost between $9.1 billion and $10.9 billion.

• Replacing Highway 520 across Lake Washington could cost from $1.8 billion to $7.4 billion, depending largely on whether the new bridge is four, six or eight lanes.

• Extending the Highway 509 freeway to Interstate 5 at South 188th Street in SeaTac, and adding lanes on I-5 from there to Federal Way, could cost between $920 million and $1.02 billion.

Those estimates all are higher than earlier ones. But department officials attribute most of the increase to a decision to factor in inflation up-front.

The last estimate for I-405, for instance, was $7.8 billion — in 2002 dollars. The new estimate states project costs in 2010 dollars, when construction is likely to be at its midpoint. That alone drove the cost estimate up $1.4 billion, department officials said.

The earliest any of the mega-projects could be completed is 2011, the department says.

⊕enlarge

TERESA TAMURA / THE SEATTLE TIMES

I-405: $9.1 billion to $10.9 billion

Options for the viaduct

The 49-year-old Alaskan Way Viaduct, built on soils that can liquefy in an earthquake, was damaged in last year's Nisqually quake. An independent engineering team hired by the state recommended last summer that it be torn down and replaced. Over 10 years, the engineers said, there's a 1-in-20 chance of an earthquake that would cause the viaduct to fail.

The cheapest alternative — simply replacing the existing viaduct and the aging seawall that helps support it — would cost from $3.2 billion to $3.5 billion, the Transportation Department says.

Seattle Mayor Greg Nickels favors a more ambitious plan to replace the viaduct with a shallow tunnel along the downtown waterfront, as well as replacing the existing Battery Street Tunnel, at the viaduct's north end, with a new tunnel that would resurface in the South Lake Union area.

The department estimates the cost of that option at $8.8 billion to $10.3 billion. Other add-ons could raise the price to $11.6 billion.

Pelz, one of the County Council members from King, Snohomish and Pierce counties who will decide which projects to submit to voters as part of a regional package, said it was highly unlikely the proposal would provide the viaduct with that much.

Current plans don't provide enough money for even a bare-bones viaduct replacement.

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JIM BATES / THE SEATTLE TIMES

Highway 520: $1.8 billion to $7.4 billion

The state transportation proposal provides just $450 million for the viaduct. A proposed $12.6 billion regional package offered last month by King County Executive Ron Sims and his counterparts from Snohomish and Pierce counties would add just $2 billion, including $500 million from tolls.

The viaduct needs a bigger piece of the regional pie, Nickels said yesterday, because its seismic vulnerability gives it a priority over projects that simply add capacity.

The Transportation Department's new viaduct cost estimates "really are staggering," said Seattle City Councilman Peter Steinbrueck, who supports the same viaduct-replacement plan as Nickels, "but so is the critical situation on the waterfront. I don't think that's sunk in yet."

Replacing the viaduct also offers a once-in-a-lifetime chance to reunite downtown with the waterfront and to reconnect neighborhoods to the north now separated by Aurora Avenue North, he said.

But McKenna said the law authorizing the regional transportation package, approved by the Legislature in March, limits spending to those portions of the viaduct damaged by the earthquake. Replacing the Battery Street tunnel doesn't qualify, he said.

Costs to do work in phases

In addition to the cost estimates for full projects, the transportation department also prepared estimates for each project for phased construction — "based on the recognition there wasn't going to be enough money for everything," said John Okamoto, assistant secretary.

McKenna said he likes a plan the department prepared for phased viaduct replacement that calls for a new tunnel from King Street to Stewart Street that would feed the existing Battery Street tunnel.

Its estimated cost: $3.6 billion to $4.3 billion.

McKenna also said he likes a plan for phased construction on I-405. It would widen the entire southern half of the freeway from Bellevue to Sea-Tac Airport, build new Kirkland lanes, add lanes to Highway 167 just south of 405 in Renton, provide rapid transit and construct park-and-ride stalls.

That plan would cost $5.2 billion to $6 billion. That's still much more than the statewide and county executives' packages provide for I-405.

State Sen. Dan McDonald, R-Yarrow Point, chief author of the regional transportation legislation, said phasing improvements on I-405 was completely unacceptable. It is also foolish to assume there will be money for second and third phases, he said — the voters will be tapped out.

"We have to figure out how to make their lives in traffic a whole lot better, and don't fool around thinking someone is going to come along with a whole bag of money," McDonald said.

TOM REESE / THE SEATTLE TIMES

Highway 509: $920 million to $1.02 billion

How costs were calculated

The Transportation Department developed its new numbers through a new process called "cost estimate validation," or CEVP, which features another layer of review by outside experts. Okamoto and David Dye, the agency's Urban Corridors Administrator, characterized it as an effort to deal more openly and honestly with risks and uncertainties.

In the past, Okamoto said, "a project (cost) number was established, and they (project managers) ended up getting burned by it."

The agency's credibility suffered when costs exceeded those estimates, said department spokeswoman Linda Mullen.

The new estimates, which cost more than $100,000 to prepare for each project, all are expressed in ranges. For Highway 509, for instance, the department says there's a 10 percent chance it will cost less than $920 million, a 50 percent chance it will cost less than $950 million, and a 90 percent chance it will cost less than $1.02 billion.

CEVP also allows the department to identify risks early, Okamoto said, and that could save money in the long run. For instance, if the process reveals right-of-way costs are a risk factor, the department could move to buy land before it gets costlier.

"But now we need to subject all these (estimates) to PEVP — the political estimate validation process," Pelz said.

The three county councils have scheduled a joint meeting June 19 in Bellevue. A decision on whether to submit a regional package to voters this fall could come then.

Seattle Times staff reporter Mike Lindblom contributed to this report. Eric Pryne can be reached at 206-464-2231 or epryne@seattletimes.com.

BILLIONS PILE UP IN ROAD COSTS

Price of unsnarling region's traffic increases, with viaduct replacement leading the way

Tuesday, June 4, 2002

By SCOTT SUNDE
SEATTLE POST-INTELLIGENCER REPORTER

Talk about the rubber meeting the road.

Rebuilding or replacing the Alaskan Way Viaduct could cost anywhere from $3.5 billion to $11.6 billion, the state revealed yesterday. And that's just a start.

The rest of the region's most pressing highway projects will cost billions upon billions of dollars, more than previously expected, state transportation officials said. For example, expanding state Route 520 from Bellevue to Seattle with six lanes across Lake Washington could cost as much as $5.9 billion -- 20 percent more than the previous top estimate of $4.9 billion. And adding two lanes to Interstate 405 could cost up to $10.9 billion, up from $7.8 billion estimated before.

State transportation planners made the estimates available yesterday to officials in Snohomish, King and Pierce counties. The three county councils will decide the details and timing of a regional tax package authorized by the Legislature to help pay for highway and transit improvements.

That regional package would be in addition to the $7.7 billion statewide gas-tax package that is going on the November ballot.

John Okamoto, Washington's assistant transportation secretary for the Northwest region, said planners came up with the costs using a new estimating method. The costs of projects are higher than in previous estimates.

Asked if he thought it is realistic to expect voters to agree to pay for such expensive projects, Okamoto said that is up to the three counties to decide.

Dwight Pelz, chairman of the King County Council's Transportation Committee, saw the cost estimates yesterday but declined to comment on them.

Much of the cost reflects inflation, as work is projected out over 10 years or more. But planners also determined that pitfalls may increase project costs. New national earthquake standards for bridges, for example, could add $40 million to complete state Route 509. The difficulty of buying rights of way along I-405 and the ratcheting cost of the land could add $230 million to that freeway project.

The estimates include "a mix of the very likely, the probable and the maybe," the Department of Transportation said. Project engineers, for example, know the number of miles to be paved and the cost of asphalt and can project the likely increases due to inflation five years from now, yesterday's report said. But it's only a guess how much delay and cost overrun might be caused by finding contaminated soil, the agency said.

Yesterday marked the first time state planners had put a price tag on the Alaskan Way Viaduct. The 49-year-old highway took a beating during last year's Nisqually Quake.

Before yesterday, the cost of doing something about the viaduct was suggested to be more than $1 billion. It turns out it will be a lot more.

State planners pegged the cost of five options, which all include replacing the seawall, at:

- Rebuilding the viaduct, $3.2 billion to $3.5 billion.
- Replacing the viaduct with an elevated highway, $5.7 billion to $6.4 billion.
- Replacing the viaduct with a combination of elevated highways and tunnels, $7.8 billion to $8.9 billion.
- Replacing the viaduct with tunnels. There are two proposals that range in cost from $8.8 billion to $10.3 billion and $10.1 billion to $11.6 billion. The more expensive project includes a deeper tunnel to connect Battery Street with Aurora Avenue.

Other projects show increases. A Route 520 expansion to eight lanes, for example, could cost as much as $7.4 billion. It was thought to be as costly as $7.1 billion. The least expensive four-lane option would cost anywhere from $1.6 billion to $2.1 billion.

Completing state Route 509 would cost $920 million to $1.02 billion. The old estimate was $693 million. The project would complete 509 as a six-lane freeway to Interstate 5, adding new access lanes on I-5 from South 320th Street in Federal Way and completing the south access expressway to Sea-Tac Airport.

Other projects included in the estimates are:

- **State Route 167.** The project would complete the road as a six-lane freeway from Puyallup to Tacoma. It would cost from $1.6 billion to $1.8 billion.
- **Interstate 5 and state Route 16.** The project would add car-pool lanes in each direction on I-5 from state Route 512 to King County. Car-pool lanes also would be added from I-5 to Purdy on state Route 16 and from Auburn to Puyallup on state Route 167. It would cost from $1.33 billion to $1.39 billion.
- **Snoqualmie Pass.** The project would widen Interstate 90 to six lanes east of the pass and repair the freeway from the west Easton interchange to east of Hyak. The cost estimate is $760 million to $840 million.

The agency's report said state and local politicians are well aware of "public concern and skepticism about the costs of large public projects and how costs just seem to grow and grow."

Giving citizens a range of costs, along with full disclosure of the variables, "is not only politically smart, but it's common sense," said consultant John Reilly, who helped create the new estimating system.

CEVP Process

3. SUMMARY, CEVP PROCESS

This section outlines development and implementation of the WSDOT Cost Estimate Validation Process (CEVP) during the period of February through June 2002, including an overview of CEVP as it has been designed and implemented during this period.

At the time of this writing, July 1, 2002, several project CEVP reviews are still in an active state with draft reports still being finalized or under review for comment by Project Teams. Summary 1-page findings of all projects reviewed to date are included in this informational package under Tab 2 and are available on the WSDOT website – go to http://www.wsdot.wa.gov/projects/cevp/default.htm and click on the specific project. Copies are also included in this package. Further details will be posted on the web as they are developed.

CEVP Workshops

The purpose of a CEVP workshop is to perform a peer-level review, "due diligence" analysis on the scope, schedule and cost estimate for the major projects of the Urban Corridors Program. Specific objectives are to evaluate the quality and completeness, including anticipated risk and variability, of the estimated cost and schedule.

The CEVP report is generated from a multiple-day concentrated workshop led by senior WSDOT personnel with the aid of specialized consultants and involving the WSDOT Project Team.

Prior to the workshop, each of the Project Teams prepared plans, exhibits and project documents to describe the scope, character and timeframe of the project. The Teams bring their existing cost estimates, including the "base" project costs plus allowances and contingencies. Additionally, the Teams are requested to address "risk events," such as the potential for additional requirements to meet environmental regulations, geotechnical uncertainties in constructing high retaining walls, or the discovery of unexpected utilities. This pre-workshop information is reflected in the Appendices of each final CEVP report.

In addition to working to validate project costs, CEVP also serves to document the viability of assumptions made regarding the project's configuration, scope, schedule, and through the risk analysis, the potential impact of risk events. These risks events include three types:

1. Those within WSDOT control such as the project delivery method
2. Those controlled by entities other than WSDOT such as legal challenges to environmental documentation or mitigation
3. Those which are caused by "uncontrollable events" such as natural disasters

For purposes of the CEVP report, two fundamental definitions are required[1]:

1. Base cost – The most basic cost for a unit or element of the project. The base cost represents the cost which can most reasonably be expected if no significant problems occur, with typically small uncertainty or variance. The base cost is not a lower bound or minimum cost estimate because some risk elements are always present.
2. Risk events – Potential adverse events that affect the project resulting in impacts to cost, schedule, safety, performance or other characteristics, but do not include the minor variance inherent in base costs.

[1] A glossary of terms is available and is include with the project reports

CEVP Process

The CEVP process deals with base costs and risk events separately. The CEVP workshop is divided into two phases:

1. Cost Assessment or Validation – A detailed examination of base costs (including allowances) to assess the validity, reasonableness, consistency and accuracy of the Project Team Estimate.
2. Risk Analysis – A detailed examination of contingency and risk to develop projected costs and schedules related to, or caused by, potential risk events. A consideration of variability is included in this work element.

The CEVP process includes:

3. Review and assessment or validation of existing WSDOT project cost estimates by the cost experts of the CEVP Validation Team and representatives of the Project Team ("Cost Team").
4. Incorporation of risk events which can affect the cost of the project by the risk experts of the CEVP Validation Team and representatives of the Project Team ("Risk Team").

Cost Analysis

In general the project estimates for the WSDOT Mega Projects consist of the base costs plus various design allowances and contingencies to allow for known but currently undefined costs, unknown requirements or expected problems in construction. The Project Estimates vary in level of detail depending on the level of engineering completed on each project.

The Cost Team performs a "due diligence" review of the project estimate, focused on quantities, unit prices and project indirect costs to assess the current project estimate. Part of this assessment is the removal of cost elements such as "allowances, provisions, contingencies" in order to determine the base cost. The Cost Team provides an opinion on the soundness and completeness of the estimate presented.

Risk Analysis

In the CEVP work to date there has been a wide variation in the way that Project Teams have dealt with allowances and contingencies. An important part of CEVP has been to deal with this variable approach in a way that provides consistent and comparable results.

The existing Project Team Estimate provides a "point estimate," or single project cost, usually including allowances and/or contingencies but without explicitly including significant risk events that could occur. However, we know that the "ultimate cost" of a project is subject to variables and potential risk events, which can significantly influence the range of "probable projected cost". Any one cost number represents only one possible result of these multiple variables and assumptions which are not all directly controllable or absolutely quantifiable.

The cost estimating process used must therefore consider probabilities and risk events in estimating cost, using a recognized, logical and tested process, so that reasonable conclusions can be drawn as to the most probable range of cost for the alternatives and risk events considered. In the CEVP process the range of the cost estimate at any stage in a design will be composed of a base cost, that will evolve as the design matures, and a risk component that will also evolve. It is typical for the risk component to decrease as the design matures but there will always be some residual risk component in the total cost estimate until the project is completed.

The listing of risk elements reflects issues that the Project Team has identified in their design work and had included in the contingency. As the design has evolved, many of these risk items are being addressed by the Project Team and we expect that there will be continuing changes in design to realize the potential for risk management. Major assumptions concerning risk items are summarized subsequent to the risk-item discussion.

Risk Assessment

The risk assessment process is conducted simultaneously with the base cost evaluation. The following activities constituted the risk assessment:

1. A project flow chart is developed combining the sequence of major activities to be performed in the Project. The funding decision points, as described by the Project Team, are explicitly represented in the flow chart. The flow chart combines specific project elements in clusters of activities to represent the expected project flow and sequence of work
2. The "base" costs and duration for each activity on the flow chart are determined based on values confirmed or defined by the cost analysis verification team.
3. Missing items and modifications to the original Project Team plan are identified by the joint work of the cost team during the cost analysis verification activity. Indications of risk are also identified by that team and forwarded to the risk team for an analysis. The risk items and base cost items are coordinated during the evaluation process to assure that no gaps or overlaps exist.
4. The Risk Team identifies and evaluates the major risk elements and issues of concern for all of the project activities on the flow chart. For each item the team evaluated the likelihood of occurrence, possible outcomes, the potential cost impacts and the possible schedule implications. These risk issues, impacts and possible mitigation actions are described below.
5. A probabilistic model is then developed and used to analyze the risk of potential cost and schedule changes for each project. Both escalated and non-escalated (current dollars) costs are evaluated and reported. A summary of the output of this model is provided following the discussion of major risks and issues of concern.

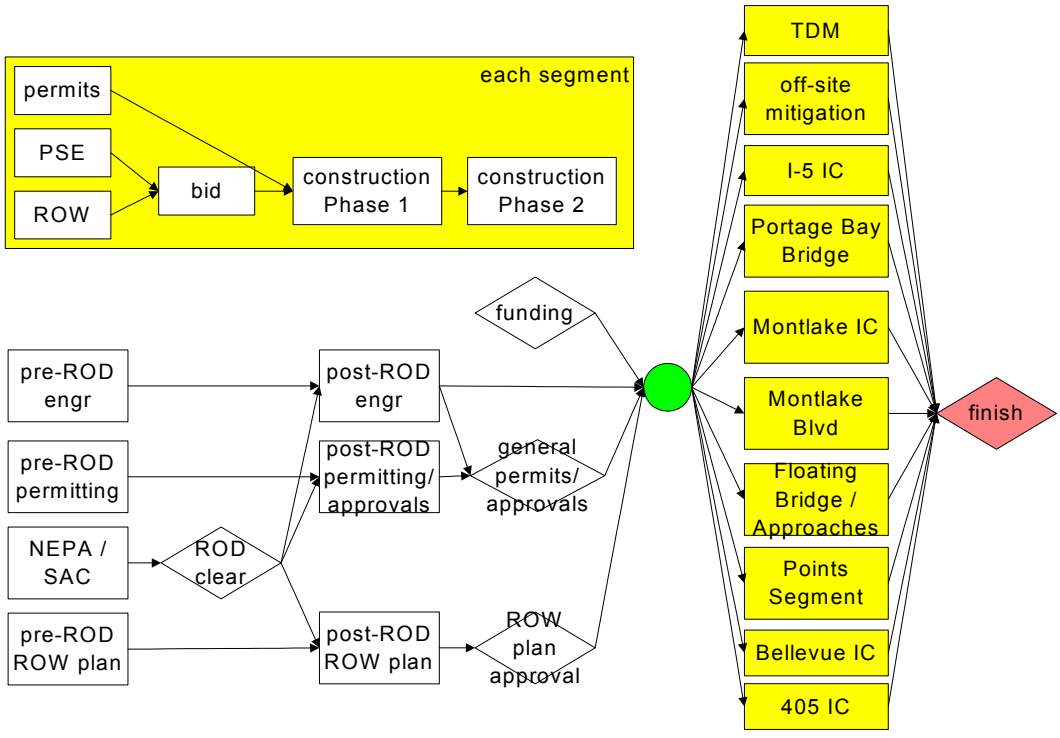


Figure 1 - Example of a Project Flow Chart (*Example is SR520, Translake*):

Risk Elements / Issues of Concern

The Risk Team identifies potential risk elements that could be defined as major issues, using a screening criterion to separate major issues having a cost impact of (say) $1 million or more, or a schedule delay of 1 month or more. Minor risk elements, those below the screening criteria, are carried as a single miscellaneous risk element with cost and duration expressed.

The Risk Team assessed these items in terms of their possible impact and the probability of occurrence. Project Team members were actively involved in identifying these impacts and probabilities, including members of both Risk and Cost Teams. Generally, the probability of occurrence is estimated on a qualitative scale that is then translated to a percentage probability using guidelines such as:

Probability Percentage	Subjective Criteria
50-100%	Very likely
25-50%	Likely
10-25%	Possible
1-10%	Unlikely
>1%	Very unlikely

Table 1 – Probability limits vs. Subjective Criteria

Identification of Potential Risk and Opportunity Events

Risk events are those with negative cost or schedule impact. Opportunity events are those with positive cost or schedule result.

For each project, risk and opportunity events are identified based on the knowledge and skill of the Project and CEVP team members. Issues, impacts, probability and potential mitigation measures are described for each project. In addition, the profile of risk or opportunity events are summarized for full-funding and partial-funding project scenarios, if applicable. The output is a listing of all identified issues of concern and potential risk events. For each event the following is defined:

Issue: A definition of the issue or risk or opportunity event, including causal events or triggers. or environment, opportunities the consequences in time or cost impact, the probability of occurrence, the shape of the event (probability distribution(s) or levels of impact related to the distribution).

Impacts: The cost(s) or schedule penalty(ies) of the event.

Opportunity: The cost(s) or schedule benefit(s) of the event.

Probability: The chance of the event occurring.

Mitigation Measures: Possible ways to eliminate or reduce risk events and possible ways to enhance opportunity events.

All of the above may include multiple scenarios for each event. An example of the results is given following (*example is from SR520, Translake Floating Bridge, numbers are not representative)*

Potential Risk / Opportunity	Cost Change	Duration Change (months)	Probability
a) Existing floating Bridge failure, or b) Portage Bay Bridge failure before replacement	a) -$170m b) -$35m	a) +24 months b) +24 months	a) 5% b) 3%
Simplify the I-405/SR520 interchange to reduce Right-of-Way taking costs	+$150m	-8 months	40%

Table 2 – Examples of Potential Risk & Opportunity Events

Results

The risk /cost model is run using a "Monte Carlo" simulation. This runs multiple combinations, usually 1000 iterations, of the defined variable risk and opportunity events, which are combined with the base costs and schedules, to produce probable ranges of cost and schedules.

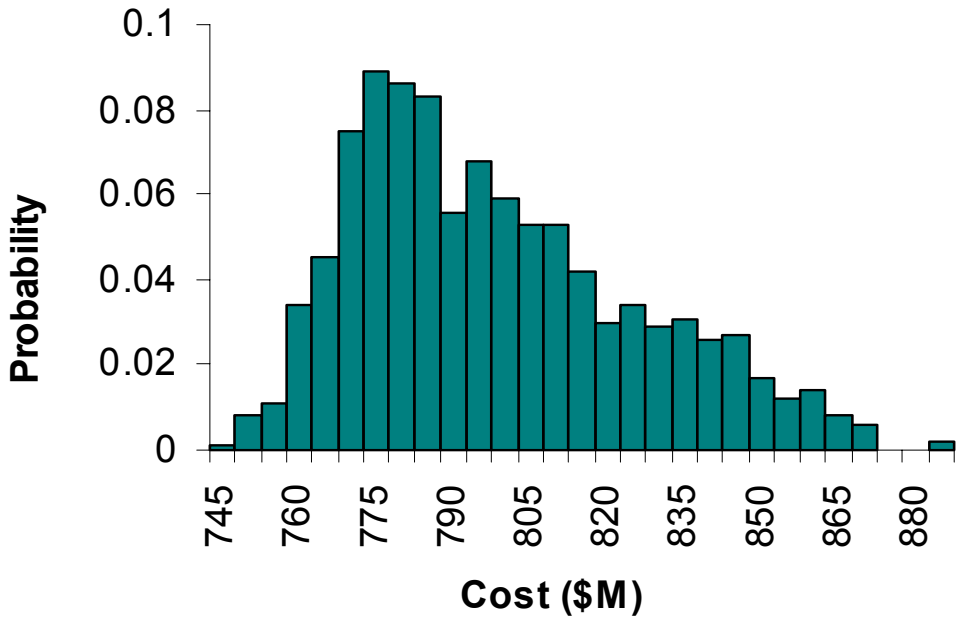
Current year costs and escalated (time of expenditure) costs are computed. Time of expenditure costs are calculated by escalating the specific activity cost elements to the probable time of construction (which varies depending on the scenario) using defined escalation percentages for that element.

Results are presented as Cost and Schedule Ranges for the fully-funded Project - and partial funding scenarios if applicable. The ranges have specific probability characteristics and are reported as percentage values.

For example, a 10% probable cost level represents that there is a 10% chance that the cost will be less than this number and that there is a 90% chance that the cost will be greater than this number.

Similarly, a 90% probable cost level represents that there is a 90% chance that the cost will be less than this number and a 10% chance that the cost will be greater than this number.

The following graphs show probable year of expenditure costs for one funding scenario (*the example shown is for the I-90 the Snoqualmie Pass East Project*).



There is a 10% chance the cost is less than $ 760 Million
There is a 50% chance the cost is less than $ 790 Million
There is a 90% chance the cost is less than $ 840 Million

Figure 2 – Example, Range of Probable Costs (I-90 Project)

Commentary on the Range of Probable Costs

Each project summary has a commentary on the results – including completion of design, range and profile of the probable costs and schedule. For example, for the above project (I-90):

> "….the long tail of the probability curve is due to the limited escalation in construction cost over time since the tunnel construction, a large risk item, is an early activity".
>
> "The increase in the Project Team Estimate is principally due to more accurately portraying the cost and delay from risks to the project (specifically more stringent seismic criteria, the seasonal nature of the work, and potential environmental approval delays to name a few).
>
> "The project duration is based on a design-bid-build delivery method. The project duration would be considerably shorter with a design-build delivery method. Subsequently, this would reduce escalation cost. The project would realize additional costs for a stipend to unsuccessful bidders and consultant costs to supplement WSDOT staff for the fast-track program management environment."

Ranking of identified Risk Events

The model reports the contribution of identified risk events (and opportunities) to the probable cost and schedule ranges. These are summarized in the reports. An example (*SR520 Translake*) follows:

Rank	Contribution to Risk Cost [1]	Risk Event (#, description)
1	26%	12. Seismic criteria
2	21%	2. Sound Transit Rail N Link Realignment
3	13%	30. Project Delivery Method
4	10%	31. Other (low risk) items
5	10%	22. ROW
6	7%	3. Market Conditions (high bids)
7	3%	14. Constructability of I-405 IC
8	2%	26. Local Access improvements
9	2%	28. TDM
10	1%	16. Construction staging areas

Note 1: contribution is stated in current $, for the fully-funded case.

Table 3 – Example of Event Ranking / Contribution to Risk Cost

Report review, finalization and dispositon

The results of the CEVP Workshop are presented first in an initial PowerPoint presentation at the end of the Workshop. Subsequently, a draft report is given to the Project Team for review, comment and feedback which is given in a post-Workshop meeting, which is scheduled several weeks after the conclusion of the CEVP workshop.

Between the conclusion of the CEVP workshop and the feedback session, several areas are addressed by the Project Team:

1. The Project Team reviews and substantiates the revised Base Cost Estimate that has been prepared during the CEVP workshop.
2. The Project Team reviews and comments on the Risk Elements identified in the CEVP workshop.
3. The Project Team begins to develop a plan to mitigate the risks identified in the CEVP workshop.
4. The Project Team identifies additional areas of concern to be addressed.

After these steps and post-workshop activities the CEVP report is finalized.

Additional Analyses

The projects may request that further model runs and revisions be made to adjust for changes in project requirements or for partial-funding alternatives.

Questions and Answers

Washington State Department of Transportation

Cost Estimate Validation Process (CEVP) Q AND A

CATEGORIES:

1) **Background Information**
2) **What is CEVP?**
3) **Budget issues**

QUESTION / ISSUE	RESPONSE
1. BACKGROUND:	
What is important about the information you are releasing?	It provides a more realistic approach to cost estimates - including consideration of potential variability and risk factors that can affect cost and schedule. CEVP also provides a method to identify the high-cost risks and develop strategies to minimize them.
What will the information be used for?	To communicate more realistic cost and schedule information to the public and decision makers, and to better manage projects to minimize risk and cost impacts.
Who prepared the information?	WSDOT Project Teams, working with independent, experienced management, design and construction professionals.
When was the information developed?	From February to June 2002.
Why are you undertaking this widespread effort to communicate the CEVP results?	1) The results about the proposed road improvement programs should be available to the public for their information and use in making decisions. 2) WSDOT believes that better communication leads to better decisions and feedback. 3) WSDOT can be held more accountable for project management and expenses if those projects are better defined and communicated.
Isn't this just a big bureaucratic CYA exercise?	What is being covered up? To the extent that WSDOT needs to be accountable, this process reveals more relevant information and communicates risks that may impact cost and schedule.

2. WHAT IS CEVP?

What does CEVP stand for?	Cost Estimate Validation Process
What is the significance of the CEVP process?	It allows a more detailed and independent review of costs and potential risks that could affect cost and schedule.
How does CEVP work?	CEVP is an intense, compressed workshop, developed jointly by WSDOT and independent, experienced industry professionals. The purpose is to quickly evaluate the scope and probable cost of large WSDOT transportation projects. Scope, cost schedule, variability (ranges of cost and schedule) and risks /opportunities are considered. Steps in the CEVP workshop: 1. A critical, independent review of the project team's initial cost estimate. 2. Identification of variability, uncertainty, risks and opportunities, which could affect cost and schedule – positively or negatively. 3. Use of a model to identify potential ranges of cost and schedule.
What is the result of CEVP?	1. A better understanding of, and higher confidence in, the project's scope, base costs, and assumptions. 2. Identification of the major risks that could affect cost and schedule. 3. Identification of opportunities to improve cost and schedule. 4. Estimation of cost ranges and schedules required to complete the project.
How is CEVP different from traditional cost estimating approaches?	It considers risk and variability and adds them to a "base cost" by assigning probabilities and magnitude of impact. The judgment of the estimator is made more explicit by the CEVP review (validation if the project and its costs are sufficiently defined) by the experienced team of independent professionals. Knowledge of the potential risks can be used to develop strategic management plans to eliminate or at least reduce these potential problems.

What estimates are you validating?	1) SR 99 Alaskan Way Viaduct and Seawall Project, Seattle 2) SR 520 Trans-Lake Washington, King County 3) I-405 Corridor Project East Side, King County 4) SR 509 Extension, South King County 5) I-5/SR 16 HOV Lanes, Pierce County 6) SR 167 Extension, Pierce County 7) I-90 Snoqualmie Pass, Kittitas County 8) SR 395 North Spokane Corridor, Spokane 9) SR 104 Hood Canal Bridge, Kitsap County 10) I-5 Everett HOV, Everett
What do you mean by "risk"? What parts of a cost estimate are risky, what parts are fairly safe?	Risks are potential events that could negatively affect the projects – such as an unexpected rise in costs, the impact of different site conditions, new environmental regulations, market conditions, etc. The 'safe' parts of cost are quantities and unit costs for projects that are routine and for which we have recent experience. The 'risky' parts of cost estimates are such things as the time needed to resolve environmental issues, new code requirements, soils and site conditions and mitigation for environmental, community and/or business impacts due to construction. The key risks for each project are identified in summary sheets from the CEVP workshops. Opportunities are potential events that could positively affect the projects – such as a better way to relocate utilities, less expensive construction methods, or bidding strategies that increase competition and therefore lower prices.
How do you estimate costs in the first place?	By either: 1) A comparison with a known, similar project. 2) A work-up of estimated quantities, unit costs and prices for the work to be done, plus contingencies.
What do you mean by "validation"?	An independent, expert review which produces agreement with the current project estimate or a list of suggested changes
I don't get this probability stuff, can you explain that?	Events which may occur in the future cannot be "exactly known" - but their potential impact and the probability of their occurrence can be estimated.
Some of the projects seem to have a fairly narrow range of possible costs, some fairly broad, how come?	The more routine, well-defined, typical projects, which have the most complete designs, will have the narrowest ranges of possible cost.
So does CEVP make it possible to estimate costs more accurately early in a project?	Yes – with CEVP we think we can estimate the range of probable costs earlier in the design phase.

Do you have to assume the project will cost 50%, 75%, 95%, 100% of the estimated range?	This depends on the best strategy for funding the project (and also the strategy for funding multiple projects).
Have previous cost estimating approaches used by DOT been inadequate?	No – the more routine projects designed and constructed by the Department have had good results regarding cost and cost performance. Unusual projects, or those in different circumstances have had more variation. Overall, within the total WSDOT program, results have been within about 8% of estimated costs – some more, some less. But – the large, complex (mega) projects are different. And, you know that some large, complex projects - such as Sound Transit's project from Convention Center to the University District and Boston's Central Artery – have had major and surprising cost increases. So, we were not confident that the normal cost estimating process would produce acceptable results for these projects. That's why we developed CEVP.
Does CEVP cost a lot of money to do?	It isn't cheap – because you need time, the workshop and the involvement of senior, experienced WSDOT staff and the independent professionals. But – CEVP requires only a very small fraction of the projected cost of the large mega- projects – around one one-hundredth of one percent.
If a project has not been through the CEVP process, are its cost estimates unreliable?	Probably not – if it is one of the more routine projects designed and constructed by the WSDOT it should have a reliable cost estimate.
So how do you decide how much to budget for a project if a project's possible costs range over hundreds of millions of dollars?	If you pick a low range you need to be ready to add funds if the cost exceeds the low range. If you pick a high range it is likely – after the project is completed – that funds will be available for other projects. This means that a strategy covering many projects is necessary.
Why should an average person care about this?	CEVP demonstrates WSDOT's commitment to accountability to the public. With an improved process like CEVP, we can better define the key issues for a project, make better decisions, improve our management and performance, communicate expectations with the public and be held accountable for constructing a project to the budgeted amount

3. BUDGET ISSUES

If I read this right, these nine projects alone could cost $20-$33 billion, is that about right?	Yes
If I take the top numbers and add all this up, are you telling me there is no way these projects can cost more than say, $33 billion or so?	With statistical certainty? Yes.
Why in the world are we even talking about a $20 to $30 billion dollar highway program?	The pent-up demand for transportation capacity also continues to rise – but continued and chronic under-investment means that obvious solutions (additional capacity and/or renovation of facilities that have exceeded their functional life) are now more costly in year-of-expenditure dollars and time to construct. The added congestion reduces regional productivity, mobility, and the confidence of businesses (Boeing, Microsoft, others) to believe that the regional infrastructure systems are sufficiently supportive. If they are not sufficiently supportive this causes loss of jobs and income. This leads to reduced personal and State income – the very resources needed to fix the problems (although it also reduces the need – but, this reasoning leads to "no need, no resources required, last one to leave the region turn out the lights"). The obvious, and conventional, "solution" to address the problems is to add more transportation capacity. This might include other options that could relieve congestion – such as massively increased car-pooling and much higher use of public transportation – if that capacity were available and the public would change its choice of mode. The transportation capacity needed might include all the proposed road improvements, plus Transportation Demand Management, plus significant additional transit systems (existing and new) and other new systems – such as the proposed Monorail. The non-road options *are viable in part* but *do not fix the full problem and are not generally acceptable to most of the public*. This is why the obvious solutions include all the road improvements being called for. A mix of solutions may be appropriate – and this may be the result of the current discussion and referendum, *but there are no easy or cheap answers*.